

ENVIRONMENTAL ASSESSMENT

Windjammer Project

**USDA FOREST SERVICE
SIUSLAH NATIONAL FOREST
HEBO RANGER DISTRICT**

Lincoln County, Oregon

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Chapter 1 Purpose of and Need for Action

This environmental assessment is written to fulfill the purposes and requirements of the National Environmental Policy Act (NEPA), as well as to meet policy and procedural requirements of the USDA Forest Service. The intent of NEPA, its implementing regulations, and Forest Service policy is to evaluate and disclose the effects of proposed actions on the quality of the human environment. These procedures are meant to improve the quality of decision-making, as well as make the decision-making process more accessible and transparent to the affected public.

Chapter 1 includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Introduction

In 2003, the Hebo Ranger District initiated the Windjammer Project Environmental Assessment, which analyzed the young managed conifer stands in the vicinity of Ball Mountain to determine if actions are needed to improve watershed conditions and habitat for aquatic and terrestrial species. The project area, shown on the Windjammer Project Map, includes 5,173 acres of National Forest System (NFS) lands.

The project area is contained within the Drift Creek Tier I Key Watershed (4,974 acres) and the South Fork Schooner Creek Non-Key Watershed (199 acres). The legal description for the Windjammer Project Area is Townships 7 and 8 South and Ranges 10 and 11 West, Willamette Meridian, Lincoln County, Oregon.

Proposed Action

The Hebo District Ranger proposes the following actions:

- Within 30 to 48 year old young managed conifer stands¹, commercially thin about 962 acres. Cable yarding, ground based equipment and horses would be used.
- Create 7 to 10 snags per acre on 222 acres (within units² 8, 9, 10 and 13).
- Create 10 snags and 10 down trees per acre, within 30 acres (adjacent to units 2, 5, 11 and 22) in areas occupied by young, dense conifer stands for the purpose of growing larger trees.
- Underplant shade tolerate species on about 185 acres (within units 4, 6, 14, 24, 31 and 33).

¹ Stand: The original clearcut area expressed in acres.

² Unit: Areas within the stands where different treatments may occur. In this document, units refer to those areas where commercial harvest would occur. The stand locations and associated units are shown on the Windjammer Project Map.

- To support the commercial thinning the following are needed:
 1. Construct about 0.50 miles of temporary roads. These roads are short segments located on relatively flat ground and would not cross any streams. These roads would be stabilized and closed to public travel after commercial operations are completed or end of current operating season, whichever comes first.
 2. Open existing closed temporary and Forest roads, 5.3 miles³ and 1.1 miles, respectively. To use these roads, some alder trees and brush would be removed from the travelways. No reconstruction is needed. These roads would be stabilized and closed upon completion of harvest operations or at the end of current operating season, whichever comes first.

Complete descriptions of these proposed actions are found in Chapter 2 Alternatives.

Relationship to Forest Plan and Other Analyses

This Environmental Assessment is tiered to the Siuslaw National Forest Land and Resource Management Plan (Siuslaw Forest Plan) and Final Environmental Impact Statement (USDA Forest Service, 1990). The Siuslaw Forest Plan was amended by the Record of Decision (ROD) for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and ROD Attachment A (Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern spotted Owl) (USDA, USDI, 1994), commonly known as the Northwest Forest Plan. Hereafter, the above mentioned plans will corporately be referred to as the Forest Plan.

The proposed actions are designed to meet the Forest Plan Standards and Guidelines. The lands within this project area are allocated to a number of Management⁴ and Designated⁵ Areas. These land allocations are briefly described below. For more detailed description of each management area or land allocation and standards and guidelines associated with them, refer to the Forest Plan. No Forest Plan amendment is needed.

Forest Plan Management and Designated Areas

National Forest System land in the Windjammer Project Area is within the following Management and Designated areas as described in the Forest Plan (ROD, A-5). In general, where land allocations overlap, the more restrictive standards and guidelines apply.

³ Temporary Road: A road that does not meet the Forest Road criteria. These roads are not intended to be part of the forest development transportation system and not necessary for future resource management.

⁴ Management Area: An Area with similar management objectives and a common management prescription.

⁵ Designated Area: Designated Area(s) overlay Management Area(s) and have different management objectives and prescriptions than the Management Area it overlays.

Northern Coast Range Adaptive Management Area (AMA)

The Windjammer Project Area is entirely within the AMA. The emphasis for this area is restoration and maintenance of late-successional forest habitat, consistent with marbled murrelet guidelines (ROD, D-15). The overall objective is to learn how to manage on an ecosystem basis in terms of both technical and social challenges. The primary technical objectives are development, implementation, and evaluation of monitoring programs and innovative management practices that integrate ecological and economic values (ROD, D-1).

Late-Successional Reserve (LSR) Designated Area

The Windjammer Project Area is entirely within the LSR. The LSR goal is protection and enhancement of late-successional and old growth forest ecosystems, which serve as habitat for late-successional and old growth related species. These areas, generally, have larger blocks of late-successional forests. These designated areas include standard and guidelines that direct management actions for the creation and maintenance of late-successional forest conditions. These Standards and Guides are listed in the ROD pages C9-C21. The standards and guidelines that apply to this project include:

- Management Assessment (page C-11) –A management assessment should be prepared for each large Late-Successional Reserve (or groups of smaller late-successional reserves) before habitat manipulation activities are designed and implemented.
- Silviculture (page C-12) **West of the Cascades**-There is no harvest allowed in stands over 80 years old (110 years in North Coast Adaptive Management Area). Thinning (precommercial and commercial may occur in stands up to 80 years old regardless of the origin of the stands (e.g., plantations planted after logging or stands naturally regenerated after fire or blowdown).
- Road Construction and Maintenance (page C-16)—Road construction in Late-Successional Reserves for silvicultural, salvage and other activities generally is not recommended unless the potential benefits exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they would be kept to a minimum, be routed through non-late-successional habitat where possible, and be designed to minimize adverse impacts. Alternative access methods, such as aerial logging should be considered to provide access in reserves.

Riparian Reserves Designated Areas

These Designated Areas cover portions of both the AMA and LSRs. Riparian Reserves include lands along streams and unstable areas where riparian-dependent resources receive primary emphasis and where special standards and guidelines apply (ROD, B-12). Riparian Reserves cover 3,628 acres in the Windjammer Project Area. The standards and guidelines that apply to this Project are:

- TM-1 (page C-31) Prohibit timber harvest, including fire wood cutting, in Riparian Reserves, except as described below.
 - (page C-32) Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.

- Road Management (page C-32)

RF-2. For each existing or planned road, meet the Aquatic Conservation Strategy objectives by:

- a. Minimizing roads and landing in Riparian Reserves.
- b. Completing watershed analyses (including appropriate geotechnical analyses) prior to construction of new roads or landing in Riparian Reserves. These proposed roads would be located in an area covered by the Drift (Siletz) Watershed Analysis, September 1996.
- e. Minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.
- g. Avoiding wetlands entirely when constructing new roads.

Northern spotted owl Reserve Pair Area

The entire Project Area is within a Reserve Pair Area (ROD, D-16). The size of a Reserve Pair Area is at least equal to the median home range for owl pairs in the province. In these Reserve Areas, all suitable habitat in each area is reserved from timber harvest. Suitable habitat is defined by the Siuslaw National Forest as stands of conifer greater than 5 acres in size with trees greater than or equal to 18 inches in diameter at breast height comprising at least 50 percent of the canopy. In these Areas the following may occur:

- Late-Successional Reserve management standards and guidelines for salvage and other multiple-use activities would generally apply in the suitable habitat portion of the Reserve Pair Area.
- Allow for management of currently unsuitable areas consistent with Late-Successional Reserve management standards and guidelines for silviculture and salvage. Management of other multiple-use activities in the unsuitable habitat should follow standards and guidelines from current plans and draft plan preferred alternatives, which may allow some activities that would not be consistent with Late-Successional Reserve management standards and guidelines.

Key Watershed

Key Watersheds are Designated Areas that either provide, or are expected to provide, high quality habitat. Tier 1 Key Watersheds contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential of being restored as part of a watershed restoration program.

The Windjammer Project proposed actions would occur within the Drift Creek Tier 1 Key Watershed and the South Fork Schooner Non-Key Watershed. The standards and guidelines for Key Watersheds that apply to the Drift (Siletz) Tier I Key Watershed are (ROD, page C-7) are:

- Reduce existing system and non-system road mileage. If funding is insufficient to implement reductions, there would be no net increase in the amount of roads in Key Watersheds.
- Key Watersheds are highest priority for watershed restoration.
- Watershed analysis is required to management activities, except minor activities such as those Categorically Excluded under NEPA (and not including timber harvest).

Other Documents

The Forest Plan requires that several analysis documents be prepared to guide the implementation of the Forest Plan. These include Watershed Analyses, Late-Successional Reserve Assessments and Adaptive Management Guides. These documents provide existing condition information and contain recommendations for attainment of the Forest Plan desired conditions.

Watershed Analysis (WA)

These documents identify important resource and information needs (data gaps), and describe ecological processes and interactions. They are completed before certain ground disturbing activities can be implemented. The Windjammer Project Area is included in the Drift (Siletz) Watershed Analysis (Siuslaw, 1996). The WA, pages 47-49, describes the existing condition of the conifer stands. In summary, about 46 percent of these stands on National Forest System land are in managed stands less than 50 years old. The WA, page 80, identifies four factors that are preventing or inhibiting the development of late-successional characteristics, which is a Forest Plan goal. They are:

1. Fragmentation of mature conifer blocks by managed stands of varying ages.
2. Even aged and often single species composition of managed stands.
3. Isolation of Late Successional Reserves by short rotation timber management.
4. Length of time for development of late-successional characteristics (Stands can be treated in many ways to accelerate growth and development of late-successional structure, but it would take time for these structures to develop.)

Late Successional Reserve Assessment (LSRA)

The Forest Plan requires that a Late-Successional Reserve Assessment (LSRA) be completed for each LSR or group of LSRs before habitat manipulation activities are designed or implemented. *“The Late-Successional Reserve Assessment for the Northern Coast Range Adaptive Management Area”* was completed January 1998. This Assessment provides a broad scale description of the resources and issues which affect late-successional habitat, describes management objectives and desired future conditions, and provides a context for future decision making. The Assessment includes recommendations for a variety of management activities considered appropriate for achieving the goals of the Forest Plan.

Proposed commercial units 4, 5, 6, 11, 12, 13, 14, 15, 21, 22, 23, 24, 31, and 33 are within the Core Late-Seral Cell i.e. at least 50% of the cell is currently in late-seral stage forest. These are treatment priority 1 i.e. these areas have the best potential for developing large blocks of interior, late-seral habitat and are the highest priority for treatment on the Hebo Ranger District. (LSRA p. 48 and Appendix H)

The remaining commercial units, 1, 2, 8, 9, 10, 17, 18, and 19 fall within the Core Early Seral Cell i.e. less than 10% of the landscape is in late-seral-stage forest. “These areas are the highest priorities for restoration treatments” (priority 3 overall) (LSRA p. 49).

Documents not required by the Forest Plan but developed to provide implementation information and guidance.

Siuslaw National Forest Roads Analysis, 2003 (RA)

On January 12, 2001, the Forest Service issued the final National Forest System Road Management Rule. This rule revised regulations concerning the management, use and maintenance of the National Forest Transportation System, and requires each Forest to complete a Roads Analysis. The Siuslaw Forest Roads Analysis is designed to provide decision makers with information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficient, and are in balance with available funding for needed management actions. The Forest RA, completed 2003, guides project level road analysis and decisions.

Purpose and Need for Action

Action is needed in the Windjammer Project Area to maintain or improve habitat for aquatic and terrestrial species in the area by accelerating the development of late-successional forest habitat and by improving watershed conditions.

What to do and how it is to be done is framed by two major underlying needs of the Forest Plan. They are:

“The need for forest habitat is the need for a healthy forest ecosystem with habitat that would support populations of native species (particularly those associated with late-successional and old growth forests) and includes protection for riparian areas and waters” (ROD, page 26)

“The need for forest products from forest ecosystems is the need for a sustainable supply of timber and other forest products that would help maintain the stability of local and regional economics on a predictable and long term basis.” (ROD, page 26)

To refine this dual need, an interdisciplinary team reviewed the Windjammer Project Area and identified the existing and desired conditions of the managed stands in the Area. The team identified actions needed to meet or implement changes that would, in the future, meet this dual need and the desired condition. The focus of this review was the conifer stands that are the basis of the late-successional forest including the coarse woody debris and snag habitat.

Existing and Desired Conditions

Existing Condition – Young managed conifer stands

Table 1-1 lists the stand acres on NFS land in the Windjammer Project Area. The managed stands (plantations) were created by clearcutting. The clearcuts were planted with 300 to 700 Douglas-fir seedlings per acre to maximize growth, and then were to be managed through a series of treatments for timber production.

Naturally regenerated Western hemlock dominates portions of many of the stands. Hemlock also tends to dominate the edges of stands where trees outside the original harvest boundary blew down following the clearcut harvest. These blow-down areas were allowed to naturally regenerate with hemlock.

TABLE 1-1: Managed and Natural Stands in the Project Area on FS Land

Stand Ages	Acres
Managed Stand: 30 years and younger	880
Managed Stand: 31 years and older	1,405
Subtotal Managed Stands	2,285
Non-Forest (lake, river, roads, meadow etc.)	138
Natural Stands	2,750
TOTAL	5,173

The young managed stands in the Project Area form rather large, contiguous blocks with relatively narrow strips of older natural stands in-between. This fragmentation of older natural stands has diminished the amount and quality of the late-successional forest habitat. A goal of the Forest Plan is to maintain and develop, or accelerate the development of late-successional forest habitat. Acceleration of the development of late-successional forest habitat would provide connectivity between blocks of existing late-successional habitat, eventually creating large blocks of late-successional habitat.

The stands proposed for treatment currently are thirty to forty-eight years-old. These stands are not complex, diverse stands that would soon achieve late-successional conditions. Desirable components of the stand, such as large-limbed, open-grown trees, may not develop due to stocking levels. The dominant species are Douglas-fir and western hemlock. There is a need in those stands dominated by Douglas-fir to develop a more “natural” mix of hemlock, spruce cedar and alder as appropriate.

The stands are crowded ranging from 174 to 330 conifer trees per acre. They are even-aged and single canopied (the crowns are all about the same height). The trees have little stem taper (the diameter of the trunk doesn’t vary much from top to bottom), few branches over one inch in diameter and small crowns. The denser stands, especially on north-facing slopes or stands dominated by western hemlock have little or no understory vegetation. Areas on south facing slopes dominated by Douglas-fir tend to have a brushy understory, generally dominated by salal. There are varying but minor amounts of western red cedar, Sitka spruce and red alder scattered throughout the stands.

Due to lower growth rates and crowded conditions, these stands are more susceptible to damage from insects or wind than stands with fewer stems per acre. Examination of other stands in the area indicates that wind is the significant disturbance agent. The topography of the area, its

proximity to the coast, and current stand densities increases the probability that an entire stand or stands could be lost in a single disturbance event. Sustained winds during the wet season that occur in the area can cause significant damage to these structurally weak stands. Due to the fragmentation of the late-successional habitat in the Windjammer Project Area, there is a need to develop wind firmness within the managed stands, to minimize stand replacement events.

Swiss needle cast is present in the Douglas-fir at severity levels in the low to moderate range. Swiss needle cast causes the growth of Douglas-fir to slow down and may increase the risk of mortality. A few of the stands have pockets of the root disease *Phyllinus weiri* that are characterized by groups of dead and down Douglas-fir.

Desired Condition – Young Managed Conifer Stands

The long-term desired condition is late-successional forest conditions. Late-successional forest characteristics include:

- some large trees (over 40 inches dbh), with large limbs and broken tops;
- multiple canopy layers, with shade tolerant species in the understory;
- forbs and shrubs scattered, in pockets, throughout the stand;
- numerous large snags (over 20 inches dbh);
- down logs in all decay classes;
- reduce the risk of large-scale blowdown.

The short-term desired condition is:

- A more heterogeneous stand with varying tree densities, gaps, and understory conditions.
- Some dominant “wolf” trees in a position to develop large limbs and deep crowns.
- Overall, fewer trees per acre, with improved growth rates on most of the remaining trees.
- Leave some areas untreated to provide stand density diversity.
- Retain some trees exhibiting defects, such as forks, crooks, butt rot, and other deformities to provide habitat niches.
- An overall increase in understory vegetation including shade-tolerant tree species.
- Vegetation in the stands composed of native species.
- Stands developing into a more wind-firm condition.

Existing Condition –Riparian Reserves

The Drift (Siletz) Watershed Analysis (page 55) discloses that approximately 50 percent of the stands are characterized as early seral. Human caused disturbance has impacted riparian ecosystems in the area. Plantations and other environments manipulated by man do not provide the range of habitat components (vertical and horizontal structure, large woody debris) needed to support the full complement of riparian-dependent wildlife. The unnaturally high rate of disturbance has increased the amount of alder, especially in riparian areas. Competition with alder will delay re-establishment of conifer, slowing the recruitment of large woody debris and long term stabilization of disturbed areas.

Desired Condition –Riparian Reserves

The Drift (Siletz) Watershed Analysis (page 55) identified that stand structure of natural stands within 150 to 300 feet of streams was similar to the Siuslaw description of Spruce-Wet plant associations. Even with the Western hemlock plant associations, the lower order streams had stand structures similar to the Siuslaw description for the Spruce-Moist plant associations. The

Drift (Siletz) Watershed Analysis (page 49) displayed data compiled from plots taken in mature of old growth stands to serve as a yardstick by which to measure the progress of restoring the watershed. The tables displaying this information can be found in the Watershed Analysis in Tables 4.6-7 through 4.6-10. In general, there would be approximately 64 to 102 trees per acre, 7 to 12 hard conifer snags per acre, 4 to 5 soft conifer snags per acre, 16 to 17 hard logs on the ground per acre, and 10 to 18 soft logs on the ground per acre.

Existing Condition — Coarse Woody Debris (CWD) and Snags

Coarse woody debris (CWD) is down wood on the forest floor such as logs and stumps. Levels of down wood, in these young managed stands, are highly variable. Down wood plots were taken on 13 of the 22 stands. The down wood pieces measured were at least 12 inches in diameter. Levels varied from a low of approximately 300 cubic feet per acre to a high of 6,000 cubic feet per acre. Most of the down wood is in the form of very large logs which is a legacy from the previous stand. It is in the soft log class, decay classes III through V.

Excerpts from the *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area* (LSRA, page 75) below, describe the current condition of CWD.

Large accumulation of CWD, including both snags and down logs, take a long time to develop naturally after a stand replacing disturbance. Due to rapid decomposition rates in the Coast Range most of the CWD from the previous stand is not detectable 100 to 150 years after it reaches the forest floor (Wright 1997). Additionally, at 100 to 150 years CWD accumulations are just beginning to increase as large trees begin to die (Spies and Cline 1998). This results in CWD levels operating on a different cycle than live trees biomass. CWD levels are actually highest early in succession and lowest in mid-seral stands,

Many of the natural 80 to 120 year old stands which would have started to contribute large CWD were harvested in the past 50 years. In commercially thinned stands, most of the suppressed trees (which would have provided CWD as they died) have been removed, snags have been felled for safety concerns, and some of the down wood has been harvested. In clearcuts, most of the live trees have been salvaged or removed as firewood. Some of the CWD was removed from the site during harvest and post harvest treatments (slash burning). Spies and Cline (1988) observed that at least six times more CWD carries over after wildfire in old-growth systems than after logging in old-growth; in addition, the CWD left after logging is smaller and decays faster. Young managed stands will not provide high levels of CWD for at least 150 years after harvest (Wright 1997).

The trees in these stands are generally too small to provide medium to large snags (21 to 48 inches dbh). Snags most commonly encountered in these stands are small trees that have been shaded-out by faster growing trees. The weighted average snag size is 9 inches dbh occurring at an average density of 7 snags per acre. Individual stands varied from zero to 27 snags per acre. Only snags 7 inches dbh and greater were measured. The higher snag densities are associated with root rot and bear damage.

Desired Condition — Coarse Woody Debris (CWD) and Snags

Strategies for Achieving desired CWD levels are described in the LSRA, pages 95 through 97. At the landscape scale, recommended CWD levels are not likely to be achieved during a single entry in early or mid-seral stands. Long-term, site specific strategies are necessary to guide current and future entries toward the goal of achieving the desired levels of snags and down wood. The Windjammer Project area proposes to utilize a combination of Strategies 2 and 3. Strategy 2 would be utilized to enhance CWD by creating snags and coarse wood within the thinned units. Strategy 3 would be utilized to enhance CWD by creating snags and coarse wood in the early seral stands that are not thinned.

Decision Framework

The Hebo Ranger District has examined possible stand treatments in the managed stands of the Windjammer Project Area and found them to be consistent with the Forest Plan. The decision to be made by the Responsible Official includes:

- Should commercial thinning and other stand treatments be applied to the young managed stands in the Project Area to accelerate development of late-successional forest habitats, as detailed in this environmental assessment?

In this context, the Hebo Ranger District has developed and analyzed the effects of the proposed actions (Alternative 2) and various alternative actions (refer to Chapter 2 and 3). The selected alternative would either be the same as the proposed action, or it would be modified based on one of the other fully evaluated alternatives and on public comments.

Summary of Scoping

Information used to identify the issues and develop the alternatives was gathered by a Forest Service Interdisciplinary Team (IDT), from field reconnaissance, District resource maps, local experience and review of comments from the public, Native American tribes, special interest groups, and state and federal organizations. Two methods were used to provide the public the opportunity to comment about the proposed actions:

- Starting in the winter of 2003, the Project has been listed in the Project Update, the Siuslaw National Forest's Schedule of Proposed Actions (SOPA), which is published and mailed quarterly to a Forest mailing list of interested groups and individuals. No comments were received by this scoping method.
- On September 9, 2003, soon after the project was initiated, the District mailed a project scoping letter to 200 interested individuals, organizations and Native American tribes. In addition, a public notice soliciting comments about the project was published in the Lincoln City NewsGuard newspaper. From this scoping method, the Forest Service received 14 letters. These comments are located in the project analysis file.

Issues

The IDT and the Hebo District Ranger responsible official for this project reviewed all of the comments to determine the significant and non-significant issues for this project. An issue⁶ is significant based upon the topographic distribution (extent), the length of time the issue is likely to be of interest (duration), or the level of interest or resource conflict (intensity). Significant issues can serve to formulate alternatives, prescribe mitigation measures or analyze environmental effects.

Non-significant issues generally are those that are outside the scope of the proposed action(s), decided by existing law, regulation, Forest Plan or higher level decision, irrelevant to the decision to be made and conjectural and not supported by scientific evidence. Forest Service regulations (1950, chapter 11(3) require that issues that are deemed not significant include a brief statement of why they would not be considered significant. For this project, these issues are in the Appendix B, Other Issues section.

Significant Issue Associated with the Proposed Action

After review of the both internal (Forest Service) and public comments, one issue, the anticipated impacts of the proposed actions to water quality and aquatic habitat is considered significant. The following discussion of this issue contains an issue statement, which generally describes the cause and effect relationship of implementing the proposed actions, and one or more concerns that detail these cause and effect relationships. Also, for each concern there are one or more elements that are used to quantify or qualify the effects between the fully evaluated alternatives. These estimates of effects are discussed in Chapter 3.

Impacts to Water Quality/Fish Habitat

The proposed activities have the potential to adversely impact water quality and fish habitat by increasing sediment in the streams that may be affected by the proposed actions.

Concern 1

The amount of sediment that may reach streams could be influenced by: 1) Temporary road construction. 2) Re-opening closed existing temporary and Forest Roads that are revegetated. 3) Use of roads that have a gravel or dirt travelway during wet periods may become rutted. These ruts may channel sediment into the streams. Downstream aquatic habitat could be damaged if sufficient sediment reaches these streams.

Elements of the Issue:

- Miles of new temporary roads.
- Miles of reopened existing closed temporary, 5.3 miles, and 1.1 miles of Forest Roads.
- Miles of existing temporary and Forest Roads with gravel or dirt surfaces used to support commercial harvest operations.

⁶ Issue: A point of discussion, debate, or dispute (about environmental effects) regarding the proposed actions.

Chapter 2 Alternatives

This chapter includes a description of the reasonable range of alternatives developed to respond to the significant issue and need for actions described in Chapter 1. It also includes a list of the design criteria (mitigation measures) that would be implemented to minimize or prevent adverse effects on environmental, economic, and social resources in the Windjammer Project Area, and be consistent with Forest Plan Standards and Guidelines.

The section, *Alternatives Studied in Detail*, describes those alternatives that meet the need for actions described above and respond to the significant issues. The section, *Other Alternatives Considered but Eliminated from Detailed Study* describes the alternatives considered but dropped from further analysis. With each is an explanation of why it was dropped.

Alternatives Studied in Detail

Alternative 1 No Action

In this alternative, none of the managed stands in the Windjammer Project Area would be treated to control density, and create coarse woody debris or snags.

This alternative does not meet the purpose and need to maintain or improve habitat for aquatic and terrestrial species in the area by accelerating the development of late-successional forest habitat and by improving watershed conditions. This alternative also does not neither work toward meeting the desired conditions described in the Chapter 1 of this Environmental Assessment nor meet the two major underlying needs of the Forest Plan. However, this is a fully evaluated alternative because it provides the baseline for analysis for the action alternatives. It is required by NEPA (40CFR 1502.14(d)).

Design Criteria Common to All Action Alternatives

To meet the Forest Plan Standards and Guidelines and reduce or prevent the adverse impacts of the proposed actions, the following project design items (mitigation measures) would be implemented. This list applies to all of the action alternatives (Alternatives 2, and 3). Where design criterion is specific to an alternative, it is found in the description of that alternative.

Commercial Thinning

Commercial Sale Design

1. Trees 20 inches dbh or greater would not be harvested, except within road right-of-way and landing clearing limits where larger trees may be removed. Trees 20 inches dbh and greater would be left on site as CWD.
2. Protective vegetation leave areas or buffers would be implemented around all streams near potentially unstable areas and wet sites. These areas would be designed to protect riparian vegetation, to maintain stream temperature, and to maintain stream-adjacent slope stability (including headwalls). These areas would not be thinned and harvested. The minimum stream buffer would be 15 feet for intermittent streams and 30 feet for perennial streams.

Logging Operations

1. Felled trees would be topped in the units where it is practical and can be done safely. Tops would remain in the units. The intent is to leave as many tops as possible to act as sediment traps that would help reduce or stop soil displacement. However, it is expected that some of the tops would be yarded to the landings.
2. Horses and ground-based equipment would not be used on slopes greater than 30 percent to reduce soil disturbance.
3. Ground-based skidding equipment would stay on designated skid trails. Ground-based skid trails would be predesignated and pre-approved before use. They would not exceed 15 feet in width and would be a minimum of 100 feet apart. Ground-based equipment would operate in the dry season, July through October, unless otherwise restricted by other resource concerns.
4. Partial or one end suspension would be required on skyline units, except at tail trees and landings. Given the uneven terrain in some units, small areas of ground lead may occur along ridge lines or benches.
5. Generally all snags and existing down wood would be retained. Snags that pose a safety hazard may be felled, but would be retained on site for coarse woody debris.
6. Trees would be directionally felled away from buffers to protect riparian vegetation from damage. Trees accidentally felled into buffers would be retained to minimize stream sedimentation or damage to riparian vegetation. Some trees could be removed as determined by the Forest Service.
7. Skyline corridors would be limited to 12 feet wide or less.
8. Where cable yarding is planned, logging systems would be designed to yard away from stream channels to minimize soil disturbance on stream-adjacent slopes. Where skyline corridors pass through riparian buffers, no more than 20 percent of the canopy would be removed in any given, 1,000-foot reach of stream. All logs yarded over streams would be fully suspended. Skyline cable landings would be built in stable areas with stable cut bank slopes. Existing landings would be used where feasible.
9. Damaged “rub trees” would remain on site.
10. To lessen damage to residual trees, trees would be directionally felled to the lead of cable corridors.
11. Equipment cleaning for all “off road” equipment would be included in the timber sale contract (includes yarders, shovels etc., log trucks not included). Provision would apply to equipment moving into the project area sale area and equipment moving out of unit 19.
12. Disturbed sites lacking canopy cover (cut/fill slopes, waste areas, landings, temp roads, tractor skid roads etc.) would be seeded and fertilized using native grass and forb seed (FS supplies seed). Rates would be 30 pounds per acre of seed and 200 pounds per acre of 16-16-16 slow release fertilizer. Seeding seasons would be April 1 through 30 and September 1 through 30.

13. Canopy cover would be maintained to the extent possible when reopening and building roads or stabilizing and closing them.

14. To maintain long-term productivity, the total acreage of all detrimental soil conditions would not exceed 15 percent of the total National Forest land within each harvest unit, excluding roads and landings. Detrimental conditions are those that would reduce the potential of the site to grow trees or vegetation.

15. Rock surfacing would be placed on all roads with gravel or dirt travelways in sufficient amounts to minimize or stop soil displacement.

16. To reduce sedimentation and road wear, “constant reduced tire pressure” provision would be included in timber sale contract.

17. Trees in riparian buffers that need to be cut to facilitate harvest operations would be dropped into the stream if possible to aid in woody debris recruitment.

18. Disturbance to the existing down woody debris concentrations would be avoided as much as practical.

19. **Commercial Sale Operating Season—Felling, Yarding, and Hauling* (dates inclusive)** —To reduce disturbance of northern spotted owls and marbled murrelets, adverse effects on aquatic species and soils and prevent bark slippage.

Table 2-2: Operating Season by Units

Units	*Operating Season for felling and yarding	Log Haul	Restriction reason(s)
1 (cable portion), 2 (cable portion) 8, 9, 10 (cable portion), 18, 19 (cable portion)	July 1-April 1	Jan 1-Dec 31	Bark slippage
17	July 1-October 31	July 1-October 31	Bark slippage and aquatic
6, 12, 21	August 6-Feb 28	August 6-February 28	Birds
4, 5, 11, 13, 14, 15, 22, 23, and 24	August 6-October 31	August 6-October 31	Birds and aquatic
31 and 33	July 1-October 31	August 6-October 31	Bark, birds and aquatics

*Note: If ground based equipment or horses are used to do the logging, their use would conclude by October 31. This applies to portions of units 1, 2, 4, 6, 10, 14, and 15

20. Felling, yarding, and hauling within 100 yards of suitable owl or murrelet habitat in occupied or un-surveyed stands would occur between August 6 and March 1. Within 100 yards of suitable habitat in occupied or un-surveyed stands, daily-timing restrictions would limit operations to within 2 hours after sunrise to 2 hours prior to sunset August 6 through September 15. These restrictions apply to units 4, 5, 6, 11, 12, 13, 15, 21, 22, 23, 24, 31 and 33.

21. Key Roads would be kept open during logging operations with no more than minor traffic delays.

22. When the Industrial Fire Precaution Level is 2 or above, the time of day restriction may be waived during the late breeding period of August 6 through September 15.

Road Management

1. Road maintenance of the Forest Roads used for log haul may include adding surface rock, blading, brushing, ditch or culvert cleaning and the addition of several ditch relief culverts would occur prior to project implementation.

2. The road construction and re-opening operating season would be August through October. Open roads would be storm proofed and blocked to traffic if they have to sit through extended periods of wet weather.

3. Monitor roads during periods of heavy rain and use straw bales to trap sediment where needed on log haul routes. Active erosion controls would be implemented if sediment is found entering stream channels.

Fire and Fuels Management

1. All requirements of the Oregon Smoke Management Plan would be followed for all prescribed burning associated with this project. Impacts to downwind residents and communities would be evaluated and minimized on burn days. Pile burning would take place when atmospheric conditions are optimal for smoke dispersion, usually in the late fall or winter.

2. Since human caused fires are the primary ignition source in the sale area the main travel routes (Secondary Low Clearance) would be the focus for hazard abatement. Units adjacent to Forest Service roads 1700, 1924 and 1900 would require treatment of slash. These areas in units 1,2,8,9,10,15,17,18,19,22,23,24 would require a 50 foot fuel break extending from the road shoulder into the units to be treated. Forest Service road 1928 is an alternate through road for the 1700 road. Units 4 and 6 on FS road 1928 would require a 33 foot fuel break. In some instances where travel routes have activity fuels on both sides of the road, the fuel breaks would also be needed on both sides of the road. This effectively doubles the amount of treatment acres. Such fuel breaks would be created by hand piling and burning the piles.

Units 5,11,12,13,14,21,31 and 33 are accessed by roads 1928, spurs 112,113 and 116; road 1924, spurs 113,114 and 117; and road 1730, spur 118 would require any landing piles that are not scattered to be burned. No hand piling is planned for these units. These roads are planned to be waterbarred and/or maintenance level 1 restricting the majority of public access.

Alternative 2 Proposed Action

The proposed and connected actions included in this alternative are: commercially thin about 962 acres, underplant about 185 acres, create snags and down wood on about 246 acres, and construct about 0.50 miles of temporary road and reopen about 6.4 miles of existing temporary and Forest Roads, and make improvements to the Forest Roads that are used for log haul. Table 2-3 shows the proposed stand treatment methods, acres, implementation dates, and land allocations where they would occur.

TABLE 2-3: Treatment, Area Information and Tentative Timelines

Est. treated Acres	Stand Age (years)	Treatment Method	Forest Plan Land Allocations (Acres) in treatment areas	Implementation Date
962	30 to 45	Variable density thinning, (commercial timber sale)	AMA: 962 LSR: 962 Riparian Reserve: 900	2006-2016
246	30 to 45	Snag and down wood creation	AMA: 246 LSR: 246 Riparian Reserve: 246	2006-2016
185	30 to 45	Underplanting	AMA: 186 LSR: 186 Riparian Reserve: 186	2006-2016

1. Commercial Thinning

Alternative 2 would treat approximately 962 acres within 22 units. Variable density thinning would be prescribed within the units. Variability would be accomplished by the following methods:

- Thinning would generally be from below. Thinning from below removes the suppressed, intermediate, and some co-dominant trees. It reserves the dominant and some co-dominant trees. Those trees removed are the ones most susceptible to wind throw and competition mortality.
- Unthinned areas would be left adjacent to the units within the same stand. The unit being the area proposed for thinning and the stand being the original clearcut area.
- Within units 1, 4, 5, 6, 8, 10, 11, 12, 13, 15, 17, 18, 19, 21, 22, 23, 24, and 33, ¼ acre patches would be thinned to 16 trees per acre. This would promote open grown characteristics and provide more light to reach the forest floor promoting understory tree development. These patches would not occupy more than 10 percent of the stand area.
- Selected dominant trees within units 1, 2, 4, 6, 8, 10, 11, 12, 13, 15, 21, 22, 23, 24, and 33 would be thinned more heavily around them to cultivate the development of deeper crowns and longer limbs.
- Three stands (48 acres) within the project area would be left unthinned and allowed to develop. These stands would develop on a slow trajectory toward late-successional habitat to provide for a continuous supply of snags, provide dense hiding cover, provide untreated stands for a comparison with treated stands, and provide dense young stands. (LSRA, page 48)

Units 1, 2, 9, 17 and 18 which are located along the paved portion of Forest Road 1700 would be thinned to approximately 90 to 105 trees per acre. This area is at risk from wind throw. By thinning to this level, it would allow individual tree development and not jeopardize the integrity of the stand from being blown down. This level of thinning makes it likely that these stands would benefit from future thinning in about 10 years to further assist their development towards late-successional habitat. The remaining units, not susceptible to wind throw, would be thinned to about 60 to 80 trees per acre.

Commercial Thinning Operations

A combination of ground based equipment, horses and cable yarding would be used to harvest about 20 million board feet of timber. Table 2-4 shows which system would be used for each treatment unit.

TABLE 2-4: Proposed Commercial Thinning Treatments

Cable	Ground Based or Horses
Units: 1, 2, 4, 5, 6, 8, 9, 10, 11, 12, 13, 15, 18, 19, 21, 22, 23, 24 and 31 Total Acres: 816	Units: Portions 1, 2, 4, 6, 10, 14, 15 and all of unit 17: Total Acres: 146

Road Management

To support the commercial thinning, a combination of existing Forest and temporary roads and new temporary roads would be needed. About 0.50 mile of temporary roads would be constructed and about 6.4 miles of existing closed temporary road and Forest Roads would be opened.

The proposed new temporary roads are extensions of existing roads in the Project Area. These proposed new temporary roads do not cross any streams. They are constructed in such a way as to minimize exposed cut and fill slopes, minimize the total amount of excavation, and avoid streams and small unstable areas within the stands. These temporary roads are located on relatively flat ground and no new ditches will be constructed. This design feature is intended to preserve hydrologic function.

The following table identifies the proposed units that would require new temporary roads, the distance between those temporary roads located in the Riparian Reserve and the nearest streams, and the proposed thinning acres accessed by each road segment.

Unit and Temporary Road Number	Length (in feet) of Temporary Roads In/Out of Riparian Reserve		*Distance (in feet) Between Temporary Road and Nearest Stream	Acres of Thinning Accessed by Temporary Road Segment
	Out	In		
2-2-A	410	0	N/A	5
4-3	525	0	N/A	8
4-4	205	200	200	8
13-1	0	390	250	10
19-2	288	0	N/A	6
19-2-A	0	111	230	7
19-2-B	0	115	320	4
21-1	0	80	70	3
22-2-A	252	0	N/A	9
31-3-A	0	100	200	2
Totals	996	1,680		62

*Estimated nearest point that the proposed temporary road may be to a stream.

Opening the exiting temporary and Forest Roads that are closed would include cutting and removing brush, small conifers and alder trees. Rock would be added to the travelways to support haul and to reduce or stop production of sediment from these roads. All of the temporary roads would be stabilized with waterbars, scarified seeded and closed to public travel. The Forest Roads that are presently closed would be stabilized and closed to traffic.

Proposed log haul would be Forest Roads 1700, 1928, 1924 and 1730. During the wet season, November 1 through February 28, logging and haul would occur on roads that access units 1, 6, 8, 9, 10, 12, 18 and 21. No ground based or horse logging would be done during the wet season. Logging and log haul would be done during the dry season, August through October, for the rest of the units.

To support log haul on Forest Roads, improvements to these roads activities may include: repairing worn asphalt surfacing, cleaning ditches, replacing surface rock and adding ditch relief culverts. The locations of existing Forest and temporary and proposed new temporary roads are shown on the Windjammer Project Proposed Action Map.

2. Coarse Woody Debris (CWD) Creation

Seven to 10 snags per acre would be created in Units 8, 9, 10 and 13 (approximately 222 acres). The objective of this proposed action is to increase CWD levels within these units. Twenty snags or down trees would be created per acre in portions of stands 2, 5, 11 and 22 (approximately 30 acres). The objective of this proposed action would be to release about 4 selected dominant trees per acre. Around each selected dominant tree, approximately 5 trees would be either felled and left or created into a snag by topping the tree above the first live limbs. These areas are not practical to thin via timber harvest. The CWD and snag creation would promote the development of scattered larger trees while conferring the benefits of additional CWD. No snag creation or CWD would be done in the riparian buffers.

3. Underplanting

Underplanting is prescribed on approximately 185 acres in Units 4, 6, 14, 24, 31 and 33.

Underplanting is planned for units that are thinned heavily enough to allow under planted trees to survive and grow. Before implementing planting, the units will be inspected to ensure the overstory is open enough, allowing sufficient light for the establishment of planted trees. It may be necessary to flag the more open areas and forego planting entire units. The primary purpose of underplanting is to begin the development of a multi-layered canopy. Approximately 50 to 70 seedlings per acre would be underplanted. Units selected for underplanting lack enough western hemlock to provide a reliable source for natural regeneration over time, contain *Phellinus weirii* pockets or have a fairly dense brush understory that will limit natural regeneration. *Phellinus* is a natural pathogen and as such will contribute to the creation of variability and coarse woody debris in the stand over time. However, planting western redcedar, a *Phellinus*-resistant species, will help ensure the presence of conifers and increase species diversity.

Only shade tolerant species will be planted, including western hemlock, western redcedar and Sitka spruce. The seedlings will have protective mesh tubes placed over them during planting to discourage animal damage. The protective tubes will have to be lifted semi-annually on the western redcedar to prevent browsing by deer and elk. Brush release, done by cutting all brush within 3-5 feet of the seedling will be required for up to 5 years following planting. Relatively large planting stock will be used to minimize the amount of release treatments needed until trees are tall enough to be above the brush.

Although hardwoods will not be planted, red alder and other hardwoods are likely to naturally regenerate in larger openings, creating additional species and structural diversity in the stands.

Specific Design Criteria for Alternative 2

1. Temporary roads used outside November 1 through June 30, would be rocked to reduce erosion. Any winter haul or haul during heavy precipitation that would be monitored by the Timber Sale Administrator and the Hydrologist or Geologist. When determined to be necessary, haul would be stopped during heavy rainfall to prevent negative soil impacts and potential mobilization of sediment.
2. At the completion of harvest activities, reopened temporary roads and new temporary roads would be waterbarred where necessary, seeded with native grass and closed to vehicle travel to protect soil resources and reduce potential for water transport of sediment.

Alternative 3 No New Temporary Roads

This alternative differs from the Proposed Action alternative in that no new temporary roads would be constructed. This would affect portions of units 2, 4, 9, 13, 15, 19, 21, 22, and 31 totaling about 62 acres. The only treatment of these areas would be to create about 10 snags and 10 down wood per acre, if funding is available. The other commercial units that have existing access, including closed Forest and temporary roads, would be treated as described in the Proposed Action alternative. The other actions in the Proposed Action alternative would be done as described.

Table 2-5—Comparison of Fully Evaluated Alternatives

This table displays a comparison of the results of the various proposed actions of the fully evaluated alternatives.

	Alternative 1 No Action	Alternative 2 Proposed Action	Alternative 3 No New Temporary Roads
Vegetation Management			
Commercial Thinning—Estimated Acres	0	962	900
Underplanting—Estimated Acres	0	200	200
Coarse Wood Debris Creation—Estimated Acres	0	252	314
Logging/Road Use			
Ground skidding/horse (acres)	0	146	140
Skyline yarding (acres)	0	816	760
Temporary road construction (mile)	0	0.50	0
Open closed Forest Roads (miles)	0	1.1	1.1
Open closed temporary roads (miles)	0	5.3	5.3
Miles of gravel and dirt surfaces used to support commercial haul.	0	20	19.5

Monitoring

Monitoring occurs at the project level and the Forest level. At the project level it is important to judge the effectiveness of the project design and design criteria. The following project items have been selected to monitor:

1. The overall soil productivity objective is to maintain soil disturbance below the 20 percent mandated by the Forest Plan and to prevent and mitigate potential adverse erosion. The sale would be monitored to see if these objectives are achieved.
2. Timber Sale Administrator would monitor the operations to ensure the objectives in the environmental assessment are achieved.
3. Common Stand Exams would be taken approximately 5 to 10 years following implementation to evaluate the effectiveness of the project.

Forest level monitoring occurs at larger scale than the project level and focuses on key activities across the forest over the long term. The results of projects, similar to this proposed project, are summarized in these key activity areas, and discussed in the Forest's annual monitoring report. The key activity areas that this project may be included in are:

- **Water Quality:** Stream temperature monitoring is done on an annual basis, in Sampson Creek, Drift Creek and Schooner Creek.
- **Forest Health:** Insect and disease are monitored yearly by aerial observation as part of the Forest Health regional program.
- **Timber volume sold and harvested** is monitored and reported yearly.
- **Northern Spotted Owl:** Monitoring of population size and reproduction. The Forest relies on the current Pacific Northwest Research demographic study.
- **Weed Control:** A general weed inventory was completed in FY 2003. Twenty-six native invasive plant species (weeds) exist on the Forest totaling 40,200 gross infestation areas. The Forest monitors how many acres are treated annually.

Alternatives Considered but Eliminated from Detailed Study

Helicopter yarding those units with no open road access

This alternative differs from the Proposed Action by the use of a helicopter to remove the trees cut in those units, about 500 acres, which do not have open road access. Cable yarding, horses or ground based equipment would be used in those units accessed by open roads, about 400 acres.

Discussion: This alternative responds to the significant issue, EA page 12. Helicopter yarding is a reasonable choice if the units lack reasonable road access, the value of the timber is high, the yarding distances are short, ½ to 1 mile, yarding is downhill, the thinning remove enough trees that the residual stand would be opened enough to allow the cut trees to be removed safely and not damage the residual stand and there is sufficient room to reasonably construct log and service landings. This alternative was eliminated from detailed study because:

1. In almost all cases the yarding from the units to the landings would be uphill. This is not cost effective and could eliminate the potential of accomplishing LSR objectives with a commercial timber sale.
2. The treatment prescriptions are such that the remaining canopy will be 50% or greater. This makes it very difficult to safely remove the cut trees due to the restricted canopy. The damage to the residual is also greatly increased.
3. The value and amount of the small diameter wood that may be removed makes a helicopter operation not feasible.
4. Helicopters require larger log deck landing area than a skyline system of today's small yarders. A minimum log drop zone is two and one half times the longest log yarded. The longest log that may be yarded in this project is about 40 feet long. The decking area is located immediately adjacent to the drop zone and should be large enough to allow decking up two days log production, provide room for equipment to move safely on the landing. This equates to a minimum of about an

acre per landing is needed. For this project about 12 landing are needed. A typical cable yarding landing is about one half this size.

5. Service landings are also needed and they must be large enough to accommodate fuel trucks, maintenance vans and room to park 3-4 vehicles and an area to land the helicopter. These service landing are typically located near the work so the yarding operation can be done efficiently. The Federal Aviation Administration recommends a minimum length and width of the landing and take off area be one and half times the overall length of the helicopter. In addition a peripheral area surrounding the land and take off area of one fourth the overall length of the helicopter is needed as an obstruction free safety zone. Each landing would occupy about one and half acres and three are needed. None of these landing exist in the Windjammer area and would have to be constructed.

In summary the amount of area that would be affected by the log drop zone, log deck and service landings is about sixteen and half acres verses the nine and half acres that would be affected by opening the existing roads and proposed temporary roads.

6. By implementation of the Design Criteria listed on pages 13-16 of this EA, the effects of the Proposed Action alternative described in Chapter 3 of this EA would be at acceptable levels, and that analysis indicates implementation of this alternative is not needed.

No ground based equipment or horses.

In this alternative, no horses or ground based equipment would be used to yard the cut trees. These areas would be cable yarded. This alternative responds to the significant issue discussed on page 12.

Discussion: This would reduce the amount of soil that may be compacted if ground based equipment or horses are used. This alternative was eliminated from detailed study because:

1. The cost to do small areas with a cable system is prohibitive.
2. By implementation of the Design Criteria listed on pages 13-16 of this EA, the effects of the Proposed Action alternative described in Chapter 3 of this EA would be at acceptable levels, and that analysis indicates implementation of this alternative is not needed.

Commercially thin all available young managed stands

In this alternative, all available young managed stands within the project area would be thinned if they are old enough and economically feasible for commercial thinning.

Discussion: This alternative would have accelerated the development of late successional forest characteristics on the largest area, increased the number of jobs in local communities, and generated the most revenue for the U.S. Treasury. However, this alternative was eliminated from detailed study because:

1. Some temporary roads necessary for access to all portions of the forest stands would be located in unstable areas. Temporary roads through these types of areas could cause slumps or slides, delivering sediment into adjacent fish bearing streams. In addition, unthinned portions of stands would provide structural diversity within the stands.

2. Proposed harvest units #16 and #25 were eliminated from all alternatives due to the high cost of constructing lengthy temporary roads for relatively limited environmental and economic thinning benefits.

Chapter 3 Affected Environment and Environmental Consequences

INTRODUCTION

This Chapter describes the physical, biological, social and economic conditions that may be affected by the fully evaluated alternatives described in Chapter 2. In some Environmental Assessments (EAs) and most Environmental Impact Statements (EISs), the existing conditions and environmental consequences have been presented in separate chapters. They are combined into one chapter for this EA to lessen repetition, reduce the length of the document, and provide a format in which existing conditions can be easily compared with predicted effects.

As directed by the Council for Environmental Quality (CEQ) implementing regulations for National Environmental Policy Act (NEPA), the discussion focuses on resource conditions in the Windjammer Project Environmental Assessment, associated with the significant issues and concerns presented in Chapter 1. The description of the affected environment succinctly describes the environment of the areas to be affected by the four fully evaluated alternatives. Only those descriptions necessary to understand the effects of these alternatives are provided.

Environmental consequences are discussed in terms of direct, indirect and cumulative effects. Direct effects are caused by implementing proposed activities and occur at the same time and place. Indirect effects are caused by implementing proposed activities and occur later in time or further removed in distance, but are still reasonably foreseeable. Cumulative effects result from incremental impacts of proposed activities when added to other past, present and reasonably foreseeable future actions regardless of what Agency or person undertakes such other actions. Some resource conditions consider a larger area if predicted effects extend beyond the Windjammer Project Area.

Access/Transportation

Introduction

This information is summarized from the *Windjammer Commercial Thinning Project Transportation Plan and Haul Route Report, March 18, 2004*. This report is in the Windjammer Project analysis file. The roads in the Windjammer Project Area directly or indirectly affect almost all activities and resources that occur in the Area. They allow the Area to be used for a variety of purposes, including recreation, past, present and future resource extraction and management, and have positive and negative effects on recreation, aquatic and terrestrial wildlife resources. The two major factors that affect the roads and their management are the need to do maintain them on a regular basis because of the wet climate and steep slopes they, at times, cross and the amount of maintenance funding that is available to do the necessary work.

The categories of roads in the Windjammer Project Area are National Forest System Roads⁷ (Forest Roads) and existing temporary roads that were constructed when the stands were clearcut. Forest Roads are on the National Forest Road system and used to manage the resources of the Area. They provide access to the Area for the public and administrative needs. The types of Forest Roads are Key and Non-Key Roads. Key roads generally connect to state, federal, county or community routes forming connections into and through the Windjammer Project Area and used as the primary access to and through the Area for a variety of reasons. Non-Key Roads are can either be closed to public travel or remain open. Those that are closed are retained on the Forest Service Road System because they are needed for administrative needs, i.e. foreseeable future projects, fire control access.

The existing temporary roads are, typically, short road segments used to access the landings when the stands were clearcut. These roads are not part of the Forest Road System. They are, generally, closed to public travel. These roads have both rocked and dirt surfaces and generally do not cross streams. These roads may be needed for future management of the stands proposed for treatment.

Road Maintenance

Forest Roads maintenance funding is very limited. Limited funding is prioritized to Key forest roads leaving the open Non-Key Roads generally not maintained except during periods of project activity.

Existing Condition and Trends

The Siuslaw National Forest Roads Analysis (January 2003) determined that Forest Roads 1700, 1924 and a portion of 1900 that connects into the 1924 are the Key Roads in the Area. Together these three key roads provide access to Drift Creek organization camp and the 1700 road continues east beyond 1924 to provides access to the Drift Creek trailhead and highway 18 at Rose Lodge.

The Forest Roads open to public travel have either paved or gravel travel surface. To reduce maintenance costs and sediment from some Non-Key Forest Roads, but allow them to remain open, waterbars were installed in 1990s. These Roads are passable by high clearance vehicles. Maintenance on them is minimal. It is expected then, that were would be less drivable (open) Forest Roads over time.

Analysis of Direct and Indirect Effects

Alternative 1 No Action Alternative

There would be no access effects associated with this alternative. Existing Key Forest Roads would continue to be maintained providing open public access to the organizational camp, recreation sites and general forest areas. Non-Key system roads would continue to grow closed eventually eliminating vehicle access. A number of the roads in the Project Area are currently not drivable since they were waterbarred about 8 years ago and left to grow closed. Some were also closed with earth berms, eliminating vehicle access. Others have continued to have high clearance vehicle use, extending the time they remain open. No changes would be made in either short or long term access.

⁷ Forest Road: A road wholly or partly within, or adjacent to, and serving the national forest system and which is necessary to protect, administer, and use the national forest system and its resources. (23 USC 660.13)

Alternative 2 Proposed Action

Planned timber haul routes include Key forest roads 1700, 1924 and 1900. Non-Key system roads 1730, 1928, 1924-113 and 1924-117 are tributary spurs that access units not directly accessed by Key roads. A combination of existing Forest Roads, overgrown existing temporary roads and proposed construction of about one half mile of short ridge top temporary roads would provide logging access into individual units. The proposed temporary roads are needed because to protect streams, soils and residual trees it is necessary to extend some of the roads in the Area to thin the stands. Planned haul direction is generally west to High 101.

There are no planned actions to reduce or increase miles of Forest Roads with this project, therefore the miles of open road and road density would not change following the project completion. During project operations some currently non drivable, overgrown existing Forest Roads and existing temporary roads would be opened for project activities. Forest Roads to be opened would be waterbarred following operations and allowed to grow closed.

The Key and Non-Key Forest Roads that would be used for log haul have not been maintained for vehicle traffic for several years due to lack of maintenance funding and the decision to waterbar and let them grow closed over time. To support this activity, brushing, cleaning ditches, adding surface rock, repairing worn asphalt surfacing and installing some ditch relief culverts are needed to protect these roads from damage and reduce sediment that may reach streams.

The existing reopened temporary roads and proposed new temporary roads would be waterbarred and bermed closed following logging operations. No temporary or roads would be left open between or after operating periods.

Alternative 3 No New Temporary Roads

This alternative would eliminate construction of the proposed temporary roads to access commercial thinning units. The re-opening and management of the existing closed Forest and temporary roads would occur as described in the Proposed Action alternative. The effects on the Forest Road system would be the same as alternative 2.

Access/Transportation-Cumulative Effects

The cumulative effects of the No Action alternative would be the continuation of the existing condition. The Action alternatives would improve, in the short term, the existing Forest Roads used by this project. It is expected due to reduced maintenance funding that these that the conditions of these Roads would revert back to conditions similar to the existing condition.

Other Activities - Other foreseeable actions include noxious weed control, public recreational use, forest products gathering for personal and commercial uses, and fire and fuels management. Due to less road access, the ability to use and manage the various resources where road access is needed would be reduced.

Soils

Introduction

The following information is summarized from the *Windjammer Project Soils and Hydrology Report January 6, 2004*. This report is located in the Windjammer Project analysis file. A study of the land and soils in the Windjammer Project Area provides a basis for understanding the existing condition of the area. Soil is a basic resource of the forest, and is the key to the productivity of an area.

Maintenance of soil productivity is dependent on protecting the soil surface from erosion, displacement and compaction. Management actions do not affect factors such as climate and soil parent material. However, management activities can affect soil nutrients and structure.

The Siuslaw National Forest Soil Resource Inventory (published in 1974) provides basic soil, bedrock, and landform interpretation for management descriptions. A copy is on file at the Hebo Ranger District. Soil descriptions are included in the Forest Plan, and the Drift (Siletz) Watershed Analysis. These documents and the Soils Report for the Windjammer Project discuss three factors that describe the existing condition.

Existing Condition and Trends

Stability

The Windjammer Project Area is located in the Coast Range physiographic province; the soils in the analysis area are highly productive silt to gravelly loams formed on a variety of bedrock materials from bedded sediments to volcanics. Side slopes and soil depths are highly variable, but soil moisture and temperature regimes are very favorable for soil biological activity and plant growth on most sites. Bedrock consists of Siletz River Volcanics overlain by the sandstone and siltstone of the Tyee Formation. According to the Soil Resource Inventory (1974), the risk of debris torrents in this area is low. Much of the area has a moderate to high risk of deep-seated earthflow slumps. Ancient slump scarps and benches are common in this area. Only a small (less than 0.1 acre), recently active soil failure was observed on Forest Service managed land during field visits. Located within Unit 22, this failure occurred soon after the initial harvest of the units, likely in the 1970's, and has since begun to stabilize.

Productivity

An important ingredient to soil productivity is the presence of down wood. These stands were harvested 30 to 40 years ago when utilization was less intense than in more recent decades. Extensive concentrations of down logs are present in some areas. Many of the stands were also burned when duff retention standards were not in place. Consequently, in some areas, little or no decomposing organic matter remains.

Another aspect of long term nutrient availability and ectomycorrhizal formation is the amount of larger woody material retained on site. The amount of large, down wood in the proposed commercial thinning units is highly variable, ranging from low to high levels, as defined in LSRA. Each unit's management activities would be planned to maintain enough large wood (dead and down) to provide for a healthy forest ecosystem and ensure adequate nutrient cycling.

Increasing human activities in the Windjammer Project Area have led to increased levels of soil disturbance and reduced soil productivity. The one management activity that has the most direct impact on soils on the NFS land portion of the Windjammer Project Area is roads. Impacts from roads persist until the road is totally reclaimed, subsurface drainage patterns restored and organic matter again accumulates on the surface. Site productivity would remain somewhat less on reclaimed roads than on similar undisturbed sites for a period of time.

Road building affects soils by removing and displacing the topsoil layers from the road prism and compacting the road surface and shoulders. The surface of the road would not support trees and other forest vegetation as long as the road is used and maintained. Trees and shrubs would grow along the road bed, but site productivity is less here than in unaffected soils. Native surface roads would grow trees and other forest vegetation again when uses and maintenance ceases. However, site productivity would be less than similar undisturbed soils.

Compaction

Road building and use and mechanized activities associated with timber harvest can disturb soils in four ways: displacement, compaction, puddling, and removal of organic matter. Displacement can occur when the upper layer of soil is removed or mixed with underlying layers during harvest or site preparation. The most common causes of displacement are log skidding or piling slash with a bulldozer. Some types of bulldozers tend to displace soils when they turn, and dozer-piling slash often results in soil mixing. Compaction occurs when heavy equipment used in skidding or site preparation breaks down soil structure, and thereby reduces the pore space within the soil. This happens most commonly when heavy machinery (dozers, skidders, mechanized fallers) make repeated passes over the same ground, particularly during times of high soil moisture. Puddling is severe compaction that limits the infiltration of water. Generally, soils are most susceptible to compaction and puddling when their moisture content is above eighteen percent. At this threshold, the ability of soil to support heavy equipment is greatly reduced. Compaction, puddling, removal of organic matter and displacement lessen site quality and soil productivity. The trend is less compaction over time.

Analysis of Direct and Indirect Effects

Cumulative impacts to soil productivity due to compaction from timber harvest and road management activities were identified as a significant issue (Chapter 1, page 6, Issue 1). This section also discusses the effects of the action alternatives on stability and productivity.

One measurement indicator for this concern is the percent of detrimental soil effects that includes disturbance and compaction for each activity area, and how this compares to the 20 percent guideline specified in Forest Service Handbook 2509.18 (22). Finally, the analysis would describe the direct, indirect and cumulative effects of reduced soil productivity due to detrimental soil disturbance associated with the alternatives.

Alternative 1 No Action

Stands would continue to develop slowly. Most stands currently have little understory vegetation and bare soil is common in many units because of the lack of sunlight to the forest floor. Intermediate and suppressed trees would slowly be removed from the stand through mortality and decay. In areas of heavy stocking, stands would stagnate. In general, plant diversity would diminish as well as soil biota because of the lack of sunlight. In areas already compacted or disturbed by the initial entries, the soil

building process would continue to return the soil to near pre-harvest conditions. Short-term impacts from harvest, such as soil disturbance and slash accumulation, would not occur.

Alternative 2 Proposed Action

Thinning promotes tree growth. Crowns increase in size and root systems expand. Evapotranspiration rates increase. These factors all promote greater slope stability. Field review of previously thinned units has shown no increase in slope instability in either the uplands or riparian reserves. Thinning within and through riparian reserves improves long-term slope stability as stand conditions change with release and increased tree growth. Thinning should emphasize the retention of a well-distributed stand of larger trees, both conifer and hard wood. These larger trees also provide the opportunity to better withstand the assaults of windstorms and floods over time.

Compaction

The two sources are compaction from commercial harvest operations, primarily ground based equipment, existing and proposed temporary roads.

The major source of compaction (and also displacement) is ground based skidding equipment. Unrestricted tractor yarding and tractor piling are not considered an option on those landtypes where sideslopes are gentle enough (generally less than 30 percent) to support tractor usage (BMP T-9 and VM-1, and FW-107). The silty nature of the fine grained soils, and evidence that significant soil moisture is available most of the year indicate that any type of unrestricted tractor yarding and piling (even low ground pressure) would lead to unacceptable soil compaction and/or disturbance.

Monitoring has shown that when designated skid roads are properly utilized in conjunction with line pulling and directional falling, compaction from ground based tractor operations generally remains at about 9 to 11 percent. Skyline operations in thinning units with small wood and intermediate supports usually impacts less than 1 percent of the unit area. In most cases, the original units were harvested using ground based systems, especially on the flatter ground. However, little evidence now remains. The few evident skid roads would be reutilized in those units that have some ground based logging. Finally, some of the ground-based harvest may be implemented with horse logging methods or a ground based processor. This is likely the case for the ground based parts of Units 1, 8, 10 and 15. Horse logging impacts approximately one half the area of that of mechanical systems. The effects of the proposed action are summarized in the following table. (Ground based mechanized harvest was used to calculate acres impacted.)

Winter haul is considered only in units 1, 6, 8, 9, 10, 12, 18 and 21 due to close proximity of units to paved Forest Service Road 1700 and extensive distance from active drainages. No ground based harvest would be performed in the winter months. Soil compaction assessed per unit would not exceed Standards and Guidelines and all units considered for winter haul would be accessed by existing temporary roads with added surface rock as necessary or the existing paved road. See Table 3-1.

Table 3-1: Soil Impacts Table

Unit Number	Acres Skyline	Logging Method	Acres-ground based	*Acres Impacted	Roads-Acres	Total Acres Impacted	Total % of Unit
1	48	Skyline,some ground	7	$0.5+0.7=1.2$	0.3	1.5	2.7
2	23	Skyline,some ground	13	$0.2+1.3=1.5$	0	1.5	4.0
4	30	Skyline,some ground	5	$0.3+0.5=0.8$	0.2	1.0	2.9
5	14	Skyline	0	$0.1+0=0.1$	0	0.1	0.7
6	25	Skyline,some ground	6	$0.3+0.6=0.9$	0.1	1.0	3.1
8	51	Skyline,some ground	7	$0.5+0.7=1.2$	0.2	1.4	2.4
9	38	Skyline,some ground	16	$0.4+1.6=2$	0.2	2.2	4.1
10	57	Skyline,some ground	19	$0.6+1.9=2.5$	0.5	3.0	4.0
11	10	Skyline	0	$0.1+0=0.1$	0.1	0.2	2
12	16	Skyline	0	$0.2+0=0.2$	0	0.2	1.3
13	34	Skyline	0	$0.3+0=0.3$	0.1	0.4	1.2
14	36	Skyline,some ground	5	$0.4+0.5=0.9$	0.3	1.2	3.0
15	60	Skyline,some ground	9	$0.6+0.9=1.5$	0.5	2.0	2.9
17	0	Ground	59	5.9	0.1	6.0	10.2
18	36	Skyline	0	$0.4+0=0.4$	0.1	0.5	1.4
19	101	Skyline	0	$1.0+0=1.0$	0.4	1.4	1.4
21	26	Skyline	0	$0.3+0=0.3$	0.2	0.5	1.9
22	78	Skyline	0	$0.8+0=0.8$	0.3	1.1	1.4
23	16	Skyline	0	$0.2+0=0.2$	0	0.2	1.3
24	23	Skyline	0	$0.2+0=0.2$	0.1	0.3	1.3
31	39	Skyline	0	$0.4+0=0.4$	0.3	0.7	1.8
33	55	Skyline	0	$0.6+0=0.6$	0.1	0.7	1.3
Totals	816		146	11.6	4.1	27.1	2.8%

*Assumes 1 percent of skyline acreage and 10 percent of ground based.

Note: Road compaction figures based on existing roads through units and new temporary road building within units. Road area assessed based on a 14 foot width of impact.

Nutrient Loss

An important ingredient to soil productivity is the presence of down wood. These stands were harvested 30 to 40 years ago when utilization was less intense than in more recent decades. Extensive concentrations of down logs are present in some areas. Many of the stands were also burned when duff retention standards were not in place. Consequently, in some areas, little or no down decomposing organic matter remains. The proposed action will provide 7 to 10 snags or down wood per acre in those units deficient of large wood.

Another aspect of long term nutrient availability and ectomycorrhizal formation is the amount of larger woody material retained on site. Management activities will be planned to maintain enough large wood (dead and down) to provide for a healthy forest ecosystem and ensure adequate nutrient cycling (FW-110). At this time, site specific needs will be considered commensurate with wildlife objectives.

Transportation System

Existing forest roads and closed temporary roads access almost all units. These existing temporary roads for the most part are native surface, overgrown with vegetation, and show little or no active erosion. They have no ditches or culverts, are often outslowed, and have few if any water bars. Most of these roads have solid subgrades, which are suitable for dry season haul with perhaps a little spot rocking in a few critical areas. Problems associated with sections of the Forest Road 1900-111 accessing Unit 22 include side cast above an unstable bench in close proximity to the scarp of a small landslide and minor drainage diversions, or blocked culverts. Such problems would be addressed prior to reentry. All roads used in wet season would require rocking.

New temporary roads built to access some harvest units (about 2,676 feet) would be located on ridgetops with no ditches and culverts.

Skid trails within units would be developed where necessary to promote access where ground harvest operations are implemented. Designated skid trails would be used and where feasible remnant skid trails from previous entries would be reused.

At the completion of logging activities, the reopened existing temporary roads and new temporary roads would be water barred as appropriate to control storm run off and closed to vehicle travel. Experience has shown that these closed roads revegetate quickly, typically within 1 to 2 years after they are closed. In summary, development of the transportation system necessary for this project would maintain slope stability, and would produce little or no off site erosion.

Alternative 3 No New Temporary Roads

Under this alternative no temporary roads would be built. This would reduce the soil area impacted by a linear length of 2,676 feet with an approximate width of 14 feet (0.8 acre). There is no increase in permanent roads proposed for the Windjammer Project. Without building the temporary roads (2,676 feet) for this project, 62 acres of thinning to improve forest health would be excluded from the project. The remaining 900 acres would be accessible via existing roads.

Soils-Cumulative Effects

Alternative 1 No Action

Cumulative effects for soils would be the same as the indirect and direct effects discussed for soils under the no action alternative.

Alternative 2 Proposed Action

The effects by the Proposed Actions on the soils resource are very limited in scope. In addition, no individual unit would have adverse impacts greater than 10.2 percent (Unit 17 if harvested with mechanized equipment). In relation to the Forest Standard, this individually or cumulatively is well below the 20 percent threshold.

At this time, no single unit of measure of long-term soil productivity is widely used. Information on the survival and growth of planted seedlings may indicate short-term changes in site productivity. However, the relationship between short-term changes and long-term productivity is not fully understood at present. Experience indicates that the potential impacts on soils are best evaluated on a site specific, project-by-project basis. The major soils concerns –compaction, nutrient loss, displacement, and instability – are most effectively evaluated, for both short and long term effects, at the project level. With proper project implementation, unacceptable cumulative effects on the soils resource are not anticipated from any action alternatives. Consequently, the utilization of soil protection measures and best management practices precludes the need for additional cumulative effects analysis.

Alternative 3 No New Temporary Roads

Cumulative effects would be similar to the cumulative effects of the proposed action except in relation to the building of new temporary roads. No new temporary roads would be built with the implementation of this alternative. This would result in less soil compaction/displacement in an area 2,676 feet in length with an approximate impact width of 14 feet or an impact area of 0.8 acres.

Other Activities – This section discusses the effects of two categories: This Project's proposed actions, which include underplanting and snag creation, and the other foreseeable routine actions, which may include noxious weed control, road maintenance, administrative road use, public recreational use, and small forest products gathering for personal use. These activities do not involve the use of heavy equipment other than on existing road surfaces. Based on the types and extent of these uses in the Windjammer Project Area, no detrimental soil disturbance is anticipated.

Water Quality

Introduction

This information is summarized from the Windjammer Project Soils and Hydrology Report, January 6, 2004. This report is located in the Windjammer Project analysis file. The Drift and Schooner Creek Watersheds include a mixed ownership of county, small private, rural residential, private timber, industrial timber and Forest Service. Past activities associated with timber harvest, stream treatments, and road construction/failures have had the greatest effects on aquatic resources in the Windjammer Project Area. These effects include 1) Sediment delivery to streams from culvert failures during the 1996 and 1998 rain events. 2) Clear cut harvest with minimal buffer retention along stream channels, impacting solar input to streams in this area and possibly impacting stream temperature. Current practices are directed to improve dense overstocked stands planted following clear cut harvest and promote tree health by encouraging the larger trees to

Existing Condition and Trends

For concerns related to water quality the 5th field watersheds of Schooner Creek and Lower/Drift (Siletz) were analyzed.

The Oregon Department of Environmental Quality's 303d list for water quality limited streams has included in the Drift (Siletz) Watershed; Drift, Gordey and North Creek for temperature from headwaters to the mouth. There are municipal water rights on Schooner Creek, Drift Creek and Gordey Creek.

Roads within in the Project Area include paved, graveled and dirt surfaces. The conditions of the roads range from those that pose a potential negative resource risk to others that pose minimal risk. Road maintenance in the Project Area would continue at a reduced level. Key roads identified in the Road Management Plan would continue to receive ditch/culvert cleaning, brushing and blading on a three year rotational basis. Road maintenance funding has decreased however, and those roads currently open that are not part of the National Forest Key Road System would eventually become overgrown and undriveable. The potential for undersized culverts on stream crossings to plug on such roads would also increase. Without proper maintenance or proper road closure, the potential for undersized culverts on stream crossings to plug could increase.

Analysis of Direct and Indirect Effects

Alternative 1 No Action

The direct and indirect effects of the existing condition would continue.

Action Alternatives

In this alternative, there would be no change in the current road density. Road surfacing and maintenance along the haul route would be completed prior to thinning and haul. No negative impact on water quality is anticipated as a result of this project. The effect on water yield is unknown at this time; however, no significant changes are expected. Road use necessary to perform thinning operations and haul is not anticipated to result in increased road related negative impacts on water quality.

Thinning stands of this nature is expected to result in no negative impacts to water quality. Thinning smaller suppressed timber from overstocked stands would encourage healthy growth in the remaining large trees. This result is beneficial to slope stability and the actions required to perform the thinning would cause minimal impact to soil and have no affect on water quality.

No negative impact on water quality is anticipated as a result of building the necessary 2,676 feet of temporary road identified in the proposed action. All new temporary roads would be located ridge tops and not require ditches or culverts. They are a considerable distance from streams. All new temporary roads would be constructed during the summer months used to access timber in 8 different units and waterbarred where necessary, seeded with native grass seed and closed to vehicle travel. None of the new temporary roads built would be used for winter haul. The use of ground based equipment is restricted to the dry season, and it is expected that these travelways will revegetate quickly, so no sediment is expected.

Water Quality-Cumulative Effects

There are no expected direct or indirect effects on water quality as a result of implementation of the proposed actions. All project components thinning timber, reopening existing roads, building new temporary roads is occurring high in the watershed. Much of the activity will occur in the summer months when the already small streams (1-2 foot bankfull width streams) are running dry if intermittent or flowing at a much reduced level if perennial. The streams within the units are laden with large wood and have a high stream channel complexity. If sediment did reach a stream channel as a result of our actions this channel structure would act to retain sediment and it is believed that sediment would be captured and retained within 100 feet of entering. Similar is true of temperature, adequate stream buffers on average 50 feet from each side of any perennial stream, coupled with stream aspect and slopes of the stream banks down to the water provide considerable shading. Also much of the roads used to access this timber are high in the watershed along ridges with no hydrologic connection. Cumulative effects result from incremental impacts of proposed activities when added to other past, present and reasonably foreseeable future actions regardless of what Agency or person undertakes such other actions. If there are no expected impacts on water quality from the proposed activities then further discussion of cumulative effects is unnecessary.

Other Activities on National Forest System Land-- This section discusses the effects of two categories: This Project's proposed actions, which include underplanting and snag creation, and the other foreseeable routine actions, which may include noxious weed control, road maintenance, administrative road use, public recreational use, and small forest products gathering for personal use. These activities do not involve the use of heavy equipment other than on existing road surfaces. Based on the types and extent of these uses in the Windjammer Project Area, no detrimental soil disturbance is anticipated.

Aquatic Conservation Strategy

On March 22, 2004 the USDA Under Secretary for Natural Resources and the Environment signed Record of Decision (ROD) amending the Northwest Forest Plan. The decision clarifies provisions relating to the application of the ACS. Specifically, the amendment removes the need for deciding officials to certify that individual projects meet ACS objectives at the site-specific level and short time frames. Instead, the ROD requires individual projects to meet ACS standards and guides and that ACS objectives be met at watershed or larger scales (5th field hydrologic fields or greater) and over longer

time periods of decades or more. Project records must also demonstrate how the decision maker used relevant information from watershed analysis to provide context for project planning.

Relevant information from the Drift (Siletz) Watershed Analysis (September, 1996), and the fisheries Biological Assessment, Windjammer Project was incorporated by reference into this environmental analysis. Based on this information, all project activities will meet the ACS standards and guides, and all ACS objectives will be met at the 5th-field watershed scale and over longer time periods of decades or more.

Young Managed Stands

Introduction

The forests in the Windjammer Project Area are composed of a variety of vegetation. This vegetation occurs in diverse combinations and patterns of species, ages, sizes, shapes, and structure. These diverse forests provide a multitude of social, biological and ecological benefits, such as wildlife habitat, timber products, firewood, mushrooms, berries, clean air and water, and a pleasing setting for human enjoyment. Disturbance processes and logging have played major roles in shaping the current forest conditions. A thorough description of the vegetation is included in the Drift (Siletz) Watershed Analyses, and the LSRA. For a description of current conditions see Chapter One, Purpose and Need, pages 2 and 3.

Analysis of Direct and Indirect Effects

Alternative 1 No Action

No stand treatments would be done at this time. There is no immediate direct effect on the stands. In their current condition, the young managed stands would not develop late-successional habitat characteristics in the near future. This is due to:

- Declining diameter growth rates associated with these stands, thus increasing the time needed to develop large trees, snags and logs,
- The lack of species diversity both in the overstory and understory,
- The lack of spatial variability that contributes to the development of differing stand structures such as “wolf trees”.
- Stands that are primarily Douglas-fir would continue to have little species diversity and would be less resilient to diseases such as Swiss needle cast or *Phellinus*.
- An increased risk of the stand blowing down.

Another indirect effect of “no action” is that it limits options for future treatment. The tree crowns would continue to become smaller and over time thinning becomes less and less an option due to increased windthrow risk and the stand’s inability to respond to thinning.

The unthinned stands would contribute a steady input of small snags over a long period of time. Pockets of *Phellinus* root rot would also provide an on-going input of snags, contribute to stand diversity and provide some of the disturbance needed to further stand development towards a more “natural” condition. If windthrow restricted to relatively small areas (rather than blowing down entire stands) it would also provide for some diversity and “push” stand development forward.

Action Alternatives (Alternatives 2 and 3)

The difference between the action alternatives is the construction of the proposed temporary roads. If the roads are not constructed about 62 acres would not be commercially thinned. This acreage includes parts of some of the proposed units. Snags and CWD treatments would be done on these acres.

Recent research (Carey, 2002; Franklin, 2001; Garman, 2003; Hunter, 2001; Muir, 2002; Tappeiner, 1997; and Thysell, 2001) shows that thinning can improve the probability that these stands would develop late-successional forest characteristics within the next 100 years. Thinning would result in increased diameter growth, crown development, and understory diversity.

Following treatment (thinning, underplanting and CWD creation) direct affects would include:

- Fewer trees per acre
- A higher average stand diameter (because smaller trees have been removed)
- More light to the forest floor
- Different relative proportions of tree species (for instance, if only Douglas-fir is cut, there would be more western hemlock relative to the Douglas-fir than prior to thinning)
- More down wood and snags (in units where snag creation is planned)
- Greater variability in tree spacing
- An immediate increase in understory trees (in under planted units)

Thinning is not known to spread Swiss needle cast or increase the rate of infection in the tree. However, there is a concern that thinning infected stands may exacerbate the disease's effects on the remaining Douglas-fir, particularly by increasing the stress on needles exposed to the drying action of wind. Conversely, it is possible that because thinning increases the amount of resources available to the remaining trees, they would be more vigorous, develop larger crowns and be in a better position to maintain growth in spite of the disease. The stands under consideration are not considered to have a high Swiss needle cast severity rating. The objective of thinning these stands is to maintain or increase the growth rates of the remaining trees. It is certain that without thinning growth rates would decline. Thinning of Douglas-fir on the Hebo Ranger District has been demonstrated to improve growth rates and canopy development even with the presence of Swiss needle cast. Another objective, the development of an understory, particularly the initiation of a second canopy layer of shade-tolerant trees, can only be achieved by opening up the Douglas-fir canopy by thinning.

The harvest of trees would result in the loss of potential CWD and snags, in the short term. It is anticipated that some of this loss would be made up by mortality that may occur due to natural processes such as *Phellinus*, windthrow, logging damage, etc. Also, tops of harvested trees would remain in the units providing an immediate short term source of additional CWD. Untreated portions of stands and stands left unthinned would provide a gradual input of small trees dying from competition. Part of the purpose of the project is to increase tree growth so that larger trees would be available as snags and down wood sooner than if left unthinned.

Thinning would preserve options for future treatment. The thinned stands would remain in a much healthier, stable condition allowing for future treatments as more is learned about managing towards the desired conditions.

Young Managed Stands-Cumulative Effects

The existing condition discussion in Chapter One, Purpose and Need, describes the cumulative effects of the past management based on clearcutting and planting back at high seedling densities. To summarize, currently in the Project Area, approximately 44 percent of the Forest Service land is in plantations that originated between 1956 and 1991. Although 53 percent of the Forest Service land is in mature, natural stands, much of it occurs in relatively narrow bands located between relatively large blocks of plantations. It is assumed that all private land within the Project Area is being managed for timber production on short rotations and would not reach late-seral conditions.

The Forest Plan has changed the goals for the Windjammer Project Area from an emphasis on timber production to development of late-successional habitat. The District's precommercial thinning program over the last 3 years has concentrated on stands within Key Watersheds, including the Project Area. Over the past 3 years, 399 acres within the Project Area have been precommercially thinned. These stands originated between 1977 and 1991. Thinning emphasized variability with an average of about 150 trees per acre left after thinning. This essentially completed the precommercial thinning within the Project Area. Although records for stands planted prior to 1976 are not readily available, it is assumed that most of the acres planted between 1974 and the present were precommercially thinned, generally to stocking levels between 200 to 300 trees per acre. These stands would require commercial thinning between ages 30 to 45 years old approximately 15 years from now.

Up until now, only one stand in the Project Area has been commercially thinned. This was Schooner Sails Unit One, 23 acres thinned in 2002.

Alternative 1 No Action

It is difficult to quantify what the cumulative effect of not treating the stands would be. It is anticipated that the stands would develop some late-succession characteristics in the long term. However, recent research seems to indicate that most would not or, at least would take a very long time to develop the desired conditions. Because precommercial thinning has been completed, most managed stands would have stocking in the range of 150 to 300 trees per acre. Over time, As the stands grew taller, the risk of catastrophic blow down would increase, particularly stands located along Forest road 1700 that is basically on a flat, southwest-northeast running ridge within six miles of the Pacific Ocean.

At the landscape level, two important opportunities would be lost. "Because of the existing owl pairs, importance to connectivity and the age of the late-seral stands [generally 110+ yrs.], this "southern block" of the Hebo Ranger District is the **first priority** to block up and connect late-successional habitat, primarily by thinning (density management treatments)" (LSRA, append. H) This includes all of the Project Area not adjacent to FR 1700. Units located on Forest road 1700 along with stands to the north (outside the Project Area) form an area dominated by plantations with less than 10% of the landscape in late-seral stage forest. The portion of this block included in the Project Area, because most of it is within the Key Watershed, is among the areas that are "highest priorities for restoration treatments" (LSRA, p. 49- Early-Seral Landscape Cell). Restoration as used in this sense refers to returning the watershed to a desired condition.

Action Alternatives

Under the proposed action, about 68 percent of the stand acres currently available for commercial thinning would be thinned plus an additional 2 percent would be treated by creating 10 snags and 10 trees dropped for down wood per area. Under alternative 3, about 64 percent would be thinned and 6 percent would be treated by creating 10 snags and 10 trees dropped for down wood per area. However, the snag and down wood treatments would not accelerate late successional characteristics as quickly as commercial treatments as there would be less trees treated.

Following the proposed treatments, barring an unforeseen occurrence, most vegetation management activities in the Project Area would be completed for approximately 10 years, assuming the proposed harvest would be completed by 2010. The next entry would be commercial thinning of stands that are currently less than 31 years old as well as possible re-entry into some of the currently proposed harvest units, to further their development.

Units along Forest road 1700 would be thinned lighter due to wind throw concerns and would certainly benefit from another thinning. These stands are located on the paved road at the fringe of the late-seral block. Units away from this area would be thinned heavier to limit the number of entries; however, at least one more entry at some point before age 80 would probably be desirable to get these stands on a trajectory to reach the desired condition. Although certain attributes (like deeply furrowed bark) are dependent on long time periods, cumulatively, the thinnings would leave the Project Area with healthier, more stable stands that would continue to develop towards the desired condition gradually merging with the conditions currently found in the adjacent late-successional stands.

Plants

The following information is summarized from the *Plant Biological Evaluation for the Windjammer Project, Hebo Ranger District, April 3, 2004* and the *Botanical Resources Assessment, Windjammer Project, October 10, 2004*.

Threatened, Endangered and Sensitive Plants

Potential effects of the proposed action and alternatives to the proposed action on listed (threatened and endangered) and sensitive plants were evaluated by the Forest Botanist and documented in a Biological Evaluation (BE). The BE concluded that no threatened, endangered, or sensitive plant species or potential habitat is known or suspected in or adjacent to proposed project sites and project activities under any of the alternatives would have no direct or indirect effects on these species. The nearest known sensitive plant site is a *Sidalcea hirtipes* population in the Cascade Head area, approximately 7 miles northwest of the Project Area.

Survey and Manage plants

Pre-field review evaluated the presence and proximity of known Survey and Manage (S&M) species sites and the probability of the Project Area containing suitable habitat for category A and C (pre-disturbance surveys required) S&M. There is one known site of *Ramaria aurantiisiccescens*, a category B fungi, within the Project Area. Category B requires management (protection) of all known sites. The site is located 340 meters south of unit 10. No impacts from project activities under any of the alternatives are anticipated and no project specific protective measure are needed. A review of potential habitat within areas of proposed ground disturbing activities indicated that the young overstocked plantations are not likely to support habitat for category A and C species. Given current habitat

conditions, no surveys were conducted or required for these species. No direct effects to S&M plant species are anticipated under any of the fully developed alternatives. Indirectly, commercially thinned units under Alternatives 2 and 3 are expected to develop late successional/old growth (LSOG) characteristics, which would provide suitable habitat for a number of S&M species.

This project was initiated on May 8, 2003, the Project Area and activities of all alternatives were evaluated following S&M standards and guidelines in effect during the summer and fall of 2003. Under the recent Record of Decision (ROD) To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines (USDA-USDI, 2004), this project has fully complied with S&M mitigation measure standards and guidelines and special status (sensitive) plant species policies in effect at that time. Following ROD direction for ongoing and current management activities (page 9), no additional surveys are required.

Plants

Existing Condition

Common weed species in the vicinity of the Project Area include Scotch broom (*Cytisus scoparius*), Himalaya berry (*Rubus procerus*), evergreen blackberry (*Rubus laciniatus*), bull thistle (*Cirsium vulgare*), and tansy ragwort (*Senecio jacobaea*). An invasive species/noxious weed inventory of the Hebo Ranger District was conducted during the summer of 2004, which included survey of roads, landings and other areas likely support noxious/invasive species within the Project Area. The inventory identified a Scotch broom population approximately one mile east of unit 19 along the 1700 road, no other weed infestations were found within the Project Area.

Alternative 1 No Action

No actions are proposed that would result in increased risk of weed colonization. Spread of weeds within the Project Area would continue at background levels, primarily along roads.

Alternative 2 Proposed Action

Unit 19 rated at a high risk for weed colonization. Units 8, 9 and 17 rated at a moderate risk, and all other units rated at a low risk. It is estimated that about 5 acres may be colonized in the long term.

Alternative 3 No New Temporary Roads

Risk of weed colonization under this alternative is the same as alternative 2. Although the elimination of 0.50 mile of temporary roads provides a slight reduction in risk, the opening of existing Forest Roads and temporary roads (6.4 miles) and the presence of Scotch broom in and adjacent to unit 19 render the reduction in new construction inconsequential when assessing weed risk of the entire project.

Cumulative Effect

Noxious Weeds – Other activities likely to influence weed population in the project area include ongoing weed control activities funded through Payments to Counties Title II, road management decisions to close and/or decommission roads and weed prevention practices incorporated into all Forest Service activities, permits and contracts. With the current and foreseeable future emphasis on weed/invasive species management, noxious weed infestations are expected to decline in the project area as tree-crown cover increases; open road miles decrease and weed management/treatment increases. Although new invader weed species are likely to arrive in the Coast Range of Oregon, the

weed species, mode of spread, vectors for spread, available habitat and other factors are not predictable or foreseeable,

TES Plants – Vascular plant species currently on the Forest's Sensitive list (April 28, 2004, without S&M additions) generally require specific habitats not found within the project area. These habitats are not expected to develop within the foreseeable future and no cumulative effects to TES plant species are anticipated.

Survey and Manage - Over the long term, indirect effects of the action alternatives (2 and 3) designed to promote development of LSOG characteristics in young managed stands could beneficially affect these species through development of complex and diverse LSOG habitats. Similar projects in adjacent areas could provide migration corridors for some S&M plant species to slowly begin colonization of the treated stands.

Wildlife

Introduction

The following information is summarized from the *Biological Evaluation and Wildlife Report for Windjammer Thin*, June 10, 2004. The purpose of this biological evaluation is to identify the likely effects of the alternatives including the proposed action to federally listed or proposed wildlife species, Forest Service Regional Forester sensitive species, and federally proposed or designated critical habitat. All necessary consultation with U.S. Fish and Wildlife Service (USFWS) is completed for effect determination (USFWS Biological Opinions 1-7-02-F-958 and 1-7-04-F-1113), available in the Hebo District Office for review. All aspects of the proposed action comply with all standards and guidelines and stipulations in the USFWS BO and effect determinations are same as stated in the BO.

Existing Condition and Trends

The description of the existing conditions of the habitat in the Project EA is on EA pages 33-39. This table summarizes the existing condition and what is expected in the stands after treatments.

Unit Number	Total Acres	Current Trees Per Acre	Current QMD*	Current Snags per acre	Current Ave. Snag DBH	Residual TPA**	Residual QMD
1	54	251	13.5	5	10	90	15.2
2	36	238	13.7	3	13.1	96	14.7
4	35	200	14.2	2	9.6	77	15.0
5	14	336	10.6	4	9.4	111	11.8
6	32	294	11.7	0	0	78	14.0
8	58	228	14.3	3	10.2	77	16.6
9	54	293	12.8	7	12.2	90	15.0
10	77	195	15.6	3	11.3	72	17.4
11	10	276	12.3	0	0	65	15.7
12	16	219	13.0	7	10.4	72	14.7
13	34	220	14.0	12	11.5	75	15.1
14	40	174	12.6	20	9.6	76	15.5
15	69	210	15.0	7	10.9	59	17.6
17	58	316	13.3	9	11.2	103	15.8
18	36	330	12.2	12	10.1	105	14.5
19	101	200	15.3	8	10.7	88	15.4
21	26	262	12.0	0	0	60	14.3
22	78	273	13.9	13	11	70	17.0
23	16	224	14.7	10	8.6	65	15.9
24	23	208	13.9	27	9.8	60	16.2
31	39	209	12.6	5	10.1	81	14.1
33	55	238	12.7	9	10	65	14.7
Total	962						
Wt. Ave		241	14	8	10	79	16

* Quadratic Mean Diameter

**After harvest and snag creation

Species Considered and Evaluated

The following table includes federally listed or proposed species for the Siuslaw National Forest as provided in the September 2002 list from the Regional Office. The species noted as excluded on the table below would not be discussed further in this document.

Common Name	Species	Status	Species Excluded	Reason for Exclusion
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened		
American Brown Pelican	<i>Pelecanus occidentalis</i>	Endangered	YES	Lack of suitable habitat
Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>	Threatened	YES	Lack of suitable habitat
Northern Spotted Owl	<i>Strix occidentalis caurina</i>	Threatened		
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Threatened		
Oregon Silverspot Butterfly	<i>Speyeria zerene hippolyta</i>	Threatened	YES	Lack of suitable habitat

The following table includes Regional Forester Sensitive Species for the Siuslaw National Forest. Sensitive animal species are from Regional Office lists updated July 2004. The species noted as excluded on the table below would not be discussed further in this document.

Common Name	Species	Species Excluded	Reason for Exclusion
BIRDS			
Bufflehead	<i>Bucephala albeola</i>	YES	Lack of suitable habitat
Harlequin Duck	<i>Histrionicus histrionicus</i>	YES	Lack of suitable habitat
Peregrine Falcon	<i>Falco peregrinus anatum</i>	YES	Lack of suitable habitat
Streaked Horned Lark	<i>Eremophila alpestris strigata</i>	YES	Lack of suitable habitat
Aleutian Canada Goose	<i>Branta canadensis leucopareia</i>	YES	Lack of suitable habitat
MAMMALS			
Baird's Shrew	<i>Sorex bairdii bairdii</i>		
Pacific Shrew	<i>Sorex pacificus pacificus</i>	YES	Not within species range
Pacific Fringe-tailed Bat	<i>Myotis thysanodes vespertinus</i>		
California Wolverine	<i>Gulo gulo</i>	YES	Historical sighting only
REPTILES			
Northwestern Pond Turtle	<i>Clemmys marmorata marmorata</i>	YES	Distribution Willamette Valley, riparian buffers established
AMPHIBIANS			
Southern Torrent Salamander	<i>Rhyacotriton variegatus</i>		
Columbia Torrent Salamander	<i>Rhyacotriton kezeri</i>	YES	Not within species range
Foothill Yellow-legged Frog	<i>Rana boylei</i>	YES	Not within species range

PETS Species status and critical habitat

Northern Bald Eagle

The northern bald eagle nests in large old trees in mature or old growth stands near large bodies of water. History and trends in the status of bald eagle nests in Oregon are tracked annually by Isaacs and Anthony (2003). The closest recorded nest site is located one and a half miles to the west of the Project Area on private land. No suitable or potential nesting habitat for bald eagles would be removed during project implementation.

Direct, Indirect and Cumulative Effects

Alternative 1 No Action

No change from current condition would occur. There would be **No Effect**⁸ on this species.

Alternatives 2 and 3

Although no surveys have been conducted, there is a high likelihood that the Northern bald eagle utilizes the area for foraging activities and occurs in the vicinity of the proposed action. Temporary direct adverse effects, such as individual and prey displacement, may occur during commercial operation. Bald eagles are known to be highly susceptible to disturbance, particularly during their nesting season (Stalmaster *et. al.* 1985; McGarigal *et. al.* 1991). This effect of disturbance is important within 0.25 mile or 0.5 mile line of sight distance, of known nest sites during this period. The closest recorded nest is located one and a half miles away from the nearest unit within the Project Area. Direct beneficial effects, such as improved habitat quality and quantity, are likely to occur as a result of the thinning. Temporary indirect adverse effects, such as increased noise levels, could occur during operations. No cumulative impacts are expected.

Based on this analysis, no habitat would be removed; therefore the determination is a **“No Effect”**. Project design treatments would buffer riparian areas. This would protect most bald eagle perching habitat. If the animal is in the treatment areas during implementation, individual bald eagles could be temporarily displaced by the mechanical operations, which is a **“May Affect not Likely to Adversely Affect”** determination. Potential adverse impacts to individuals should not impact overall reproduction and survivability of any populations within the area.

Northern Spotted Owl

The northern spotted owl is strongly associated with dense mature and old growth Douglas-fir forests, which provide the structural characteristics required by the owls for food, cover, nest sites, and protection from weather and predation. Suitable habitat is defined by the Siuslaw National Forest as conifer dominated stands with at least 60 percent crown cover, greater than five acres in size with trees greater than or equal to 18 inches dbh comprising at least 50% of the canopy. The proposed thinning units do not have enough trees of this size to meet the criteria for suitable habitat. The habitat may be used by dispersing birds, but it does not have the complexity to be suitable habitat. There is one recorded location of a single owl within the Project Area, outside of a unit, located a half mile from

⁸ Effects determinations (*e.g.* - **“No Effect,” “May Affect – Not Likely to Adversely Effect,”** etc.) are a result of the Endangered Species Act consultation process and are relative terms used to determine the effect on these species.

unit 1 found in 1989. The closest recorded location of an owl pair, located outside the Project Area, is one and three quarter mile from unit 33 found in 2001. Planned retention of large amounts of down wood would benefit some of the prey species of the spotted owl.

Northern Spotted Owl Reserve Pair Area

On federal lands within the Northern Coast Range AMA, Northern spotted owls are to be protected by establishing a RPA around each activity center. The RPA should be equal to the home range size for pairs in the Coast Range Province and encompass as much habitat as possible close to the owl activity center. All suitable habitat in the RPA would be reserved from timber harvest. Management of currently unsuitable areas should be consistent with LSR management standards and guidelines for silviculture.

The RPA which encompasses the entire Windjammer Thin Project Area was designated with the Drift (Siletz) watershed analysis in 1996 and finalized in 1998. The area includes most of the LSR RO269. The activities proposed within the RPA are consistent with management objectives in both owl critical habitat and LSR's.

Direct, Indirect and Cumulative Effects

Alternative 1 No Action

No change from current condition would occur. There would be **“No Effect”** on this species. An indirect and cumulative effect of this alternative is the delayed or non-development of large blocks of late-successional habitat needed by this species for maintenance and expansion of the population. This alternative does not meet the desired goals of the Forest Plan, and in particular the goals described in the *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area*.

Alternatives 2 and 3

Although no surveys have been conducted, there is a high likelihood that the Northern spotted owl utilizes the area for dispersal and occurs in the vicinity of the proposed action. Some of the individuals could be negatively affected by treatment activity. Temporary direct effects, such as individual and prey displacement, may occur during operation. Direct beneficial effects, such as improved habitat quality and quantity, are likely to occur as a result of the thinning. Temporary indirect effects, such as increased noise levels, could occur during operation. No cumulative impacts are expected.

Based on this analysis, **“May affect, not Likely to Adversely Affect”** is expected for the proposed action (Alternative 2) as well as Alternative 3 for this species, due to disturbance if the birds are in the treatment areas after July 7th. Potential adverse impacts to individuals should not impact overall reproduction and survivability of any populations within the area. There is **“No Effect”** on habitat.

Northern Spotted Owl Designated Critical Habitat

The entire Windjammer Thin Project Area lies within CHU OR-43, designated for the Northern spotted owl in January 1992. For spotted owls, the primary constituent elements of critical habitat are the physical and biological habitat features that support nesting, roosting, foraging and dispersal.

Attributes of good to high quality nesting and roosting habitat typically include 60 to 80 percent canopy closure, a multi-layered, multi-species canopy with large overstory trees (greater than 30 inches dbh), large snags, large accumulations of woody debris and fallen trees, trees with deformities, and subcanopy open space for flying. Foraging habitat is similar, but may not support successfully nesting pairs. The number of trees to be left after thinning would average 77 trees per acre. The thinning stands are currently averaging 241 trees per acre.

Dispersal habitat consists of trees with adequate tree size (at least eleven inches dbh) and canopy closure (at least 40 percent) to provide protection from avian predators (USDI-FWS 1992). The proposed thinning units do not contain nesting habitat, but would function as dispersal habitat as long as the canopy closure remains at or above 40 percent (50-60 trees per acre) stand average. The areas with CWD would provide habitat for owl prey species and could serve as foraging habitat for owls. Most of the units are moderate to high level CWD, 1100-3800 cubic feet per acre. Where units are deficient, under 1100 cubic feet per acre, snags would be created for future CWD.

Direct, Indirect and Cumulative Effects on Critical Habitat

Alternative 1 No Action

No change from current condition would occur. An indirect and cumulative effect of this alternative is the delayed or non-development of large blocks of late-successional habitat needed by this species for maintenance and expansion of the population. This alternative does not meet the desired goals of the Forest Plan, and in particular the goals described in the *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area*.

Alternatives 2 and 3

As stated in the Habitat Modification B.O., heavy thinning, about 394 acres which would occur in units 10, 11, 14, 15, 21, 22, 23, 24, and 33 would reduce the canopy cover to 30-40% within the treatment units, and therefore would eliminate spotted owl dispersal habitat. Current dispersal habitat occupies about seventy five percent of the 5th field analysis area. The proposed heavy thinning would reduce this amount by one percent to seventy four percent. Therefore, this proposed level of heavy thinning in critical habitat is not expected to significantly alter critical habitat function. Light to moderate thinning would occur in the rest of the units within unsuitable or dispersal-only habitat. When thinning is implemented within dispersal habitat, the maintenance of at least 40% average canopy cover in each treatment unit would retain dispersal-quality habitat in the area. Therefore, no impacts to the functioning of critical habitat are anticipated. Direct beneficial effects, such as improved habitat quality and quantity, are likely to occur as a result of the thinning. Based on this evaluation, **“No Effect”** is expected for the proposed action (Alternative 2) as well as Alternative 3 for this species. No cumulative impacts are expected.

Marbled Murrelet

Marbled murrelet use older forest stands generally within 50 miles of the coast for nesting. More commonly, murrelets occupy old-growth forests compared to mixed-age and young forests in California, Oregon, and Washington. Suitable habitat for murrelets includes contiguous forested areas with conditions that support nesting murrelets. These forested areas are generally characterized by large trees greater than 32 inches dbh, multistoried stand, and contain a moderate canopy closure. Contiguous forests are likely to contribute to the conservation of the murrelet by reducing potential for

windthrow during storms, provide protection from predation, and provide a landscape that has a higher probability of occupancy by murrelets (USDI 1996). Potential habitat is defined as forested stands that exhibit a forest canopy of 65 to 79 years of age with large remnant trees above the canopy. The most common tree species used for nests in the Pacific Northwest is Douglas-fir. Douglas-fir is the main species used in Oregon, followed by the western hemlock. Individual nest trees include large trees, generally greater than 32 inches dbh with the presence of potential nest platforms or deformities such as large or forked limbs, broken tops, dwarf mistletoe infections, witches' brooms, or other formations providing platforms of sufficient size to support adult murrelets. The diameter of nest branches ranges from 4 to 25 inches (USFWS 1997). Nest platforms are created typically on large branches with moss covering. Nests are typically located in the top third of the tree canopy and usually have a dense overhead canopy, presumably to provide protection from potential predators and weather. This cover may be provided by overhanging branches, limbs above the nest area, or branches from neighboring trees.

Direct, Indirect and Cumulative Effects

Alternative 1 No Action

No change from current condition would occur. There would be **"No Effect"** on this species. An indirect and cumulative effect of this alternative is the delayed or non-development of large blocks of late-successional habitat needed by this species for maintenance and expansion of the population. This alternative does not meet the desired goals of the Forest Plan, and in particular the goals described in the *Late-Successional Reserve Assessment for Oregon's Northern Coast Range Adaptive Management Area*.

Alternatives 2 and 3

The coniferous stands proposed for thinning are neither suitable nor potential marbled murrelet habitat. Heavy, light or moderate thinning would have **"No Effect"** on murrelets because these areas do not currently contain any potential nesting structure and therefore are not used by murrelets. No suitable nest trees would be removed and suitable nest trees would be protected by designing prescriptions for forest stands around them within 0.5 mile that: 1) provide protection from potential windthrow, 2) require no openings within one tree length surrounding a potential nest tree, and 3) ensure no damage to any potential nest tree limbs.

Although no surveys have been conducted, there is a high likelihood that the marbled murrelet occurs in the vicinity of the proposed action. Activities within 100 yards of a nest site that result in above ambient noise levels may disrupt reproductive behaviors of murrelets at inland forest sites by causing nest abandonment, aborted feeding visits or significant alteration of breeding success. No known nest sites exist within the Project Area and the closest one is located .73 mile away. Some of the individuals could be negatively affected by treatment activity. Temporary direct effects, such as individual displacement, may occur during operation. Direct beneficial effects, such as improved habitat quality and quantity, are likely to occur as a result of the thinning. Temporary indirect effects, such as increased noise levels, could occur during operation. If the animal is in the treatment areas during implementation, individual marbled murrelet could be temporarily displaced by the mechanical operations. Potential impacts to individuals should not impact overall reproduction and survivability of any populations within the area. No cumulative impacts are expected. Based on this analysis,

“May affect, not Likely to Adversely Affect” is expected for the proposed action (Alternative 2) as well as Alternative 3, due to potential disturbance after August 5th. There is “No Effect” on habitat.

Marbled Murrelet Designated Critical Habitat

All of the proposed Windjammer Thin Project Area lies within critical habitat for the marbled murrelet (OR-02-c), designated in May 1996. The critical habitat rule for the marbled murrelet defined primary constituent elements of marbled murrelet habitat as: 1) individual trees with potential nesting platforms and 2) within one half mile of potential nest trees, forested areas which have a canopy height of at least one-half the site-potential tree height. Due to the age, diameter and growth form of the trees in this area, no Marbled Murrelet constitute habitat elements within Windjammer Thin units. No CWD would be created from trees along unit edges with whorls or deformities that could support nesting murrelets or that buffer a potential murrelet nest tree.

Alternative 1 No Action

No change from current condition would occur. An indirect and cumulative effect of this alternative is the delayed or non-development of large blocks of late-successional habitat needed by this species for maintenance and expansion of the population. This alternative does not meet the desired goals of the Forest Plan, and in particular the goals described in the *Late-Successional Reserve Assessment for Oregon’s Northern Coast Range Adaptive Management Area*.

Alternatives 2 and 3

As stated in the Habitat Modification B.O., heavy thinning which would occur in units 10, 11, 14, 15, 21, 22, 23, 24, and 33 would reduce the canopy cover to 30-40% within the treatment units, since only currently unsuitable habitat or unoccupied potential habitat would be thinned, and the thinning would promote more complex development of critical habitat, the overall impact does not adversely affect critical habitat at the local level over the short and long term. Light to moderate thinning would occur in the rest of the units within unsuitable potential habitat and all potential nest trees in adjacent stands would be protected from incidental damage and windthrow. Direct beneficial effects, such as improved habitat quality and quantity, are likely to occur as a result of the thinning. No cumulative impacts are expected. Based on this analysis, **“No Effect”** is expected for the proposed action (Alternative 2) as well as Alternative 3.

Sensitive Species

Baird’s Shrew

The species is associated with Westside lowland conifer/hardwood forest, Westside oak and dry Douglas fir forests, and montane mixed conifer forests (Johnson and O’Neil, 2001). Important habitat features for this small insectivore include wet meadows, streambanks, marshes and decaying woody material. This habitat type exists within the Project Area.

Direct, Indirect and Cumulative Effects

Alternative 1 No Action

No change from current condition would occur.

Alternatives 2 and 3

Although no surveys have been conducted there is a high likelihood that Baird's shrew occurs in the vicinity of the proposed action. Project design treatments avoid riparian and wet areas by a minimum of 30 feet and greater in some areas providing protection for the species if present. Some individuals however, could be negatively affected by treatment activity. Temporary direct effects, such as displacement, may occur during operation. Direct beneficial effects, such as improved habitat quality and quantity, are likely to occur as a result of the creation of more down woody material. Temporary indirect adverse effects, such as increased noise levels, could occur during operation. No cumulative impacts are expected. Therefore, it is expected that the proposed action would not impact the species viability nor cause the species to be driven closer to Federal listing.

Pacific Fringe-tailed Bat

This species inhabits caves, mines, rock crevices and buildings for hibernation, maternity, and solitary roosts. Little is known about foraging areas, but habitats where they have been documented are salmonberry in proximity to immature conifer (Maser, 1981, p94). They feed predominately on moths along forest edges, roads, or open areas within the forest. Although no suitable roosting habitat exists within the Project Area, foraging activities can include wide areas, and can't be discounted as occurring within the Project Area.

Proposed treatments could potentially remove habitat suitable for fringe-tailed bat prey species (moths), but at such an indiscernible level that no negative impacts to individual bats or local bat populations are expected to occur.

Direct, Indirect and Cumulative Effects

Alternative 1 No Action

No change from current condition would occur.

Alternatives 2 and 3

Although no surveys have been conducted, there is a high likelihood that Pacific fringe-tailed bat occurs in the vicinity of the proposed action. Some of the individuals could be negatively affected by treatment activity. Temporary direct adverse effects, such as individual and prey displacement, may occur during temporary road construction. Direct beneficial effects, such as improved habitat quality and quantity, are likely to occur as a result of the thinning. Temporary indirect effects, such as increased noise levels, could occur during operations. The proposed actions would alter habitats that this species could forage over, however the planned alteration would promote historic habitats. No negative cumulative impacts are expected. Therefore, it is expected that the proposed action would not impact the species viability nor cause the species to be driven closer to Federal listing.

Southern Torrent Salamander

This species lives in very cold, clear springs, seeps and headwater streams and is documented in the northern Coast Range south of the Little Nestucca River and the Grand Ronde Valley (Corkran and Thoms, 1996, p53).

Direct, Indirect and Cumulative Effects

Alternative 1

No change from current condition would occur.

Alternatives 2 and 3

Although no surveys have been conducted, there is a high likelihood that Southern torrent salamander occurs in the vicinity of the proposed action. Project design treatments avoid riparian and wet areas by a minimum of 30 feet and greater in some areas providing adequate protection for the species if present. Some of the individuals could be negatively affected by treatment activity due to noise. Temporary direct adverse effects, such as displacement, may occur during temporary road and landing construction due to noise. Direct beneficial effects, such as improved habitat quality and quantity, are likely to occur as a result of the creation of more down woody material. If the animal is in the treatment areas and outside typical suitable habitat during implementation, some salamanders could be injured by the mechanical operations though this is not anticipated. No negative cumulative impacts are expected.

Summary of Effects Determinations for PETS species and critical habitat

Common Name	Species	Status	Determinations of Effects		
			Alt 1	Alt 2	Alt 3
Bald eagle	<i>Haliaeetus leucocephalus</i>	Threatened	No Effect	No Effect	No Effect
Northern Spotted Owl	<i>Strix occidentalis caurina</i>	Threatened	No Effect	NLAA	NLAA
N.S.O. Critical Habitat			No Effect	No Effect	No Effect
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Threatened	No Effect	NLAA	NLAA
M.M. Critical Habitat			No Effect	No Effect	No Effect
Baird's shrew	<i>Sorex bairdii</i>	Sensitive	No Impact	No Impact	No Impact
Pacific fringe-tailed bat	<i>Myotis thysanodes vespertinus</i>	Sensitive	No Impact	No Impact	No Impact
Southern torrent salamander	<i>Rhyacotriton variegatus</i>	Sensitive	No Impact	No Impact	No Impact

Survey and Manage Species

The Record of Decision to Remove or Modify and the Survey and Manage Mitigation Measure Standards and Guidelines adopting Alternative 2 took effect on April 22, 2004. This Decision included a section titled, *Application of this Decision to Ongoing and Current Management Activities.* The following Stipulation applies to the Windjammer Project.

1. Survey may have already been completed for individual projects. No additional survey work is required for projects that have fully complied with the current Survey and Manage Mitigation Measure Standards and Guidelines and existing Special Status Species Policies. Known sites of species formerly included in Survey and Manage that are included in the Special Status Species Programs will be managed under Special Status Species Policies. Known sites of Survey and Manage species not included in Special Status Species Programs will be released for other management uses after the effective date of this Record of Decision.

Survey and Manage Species are identified in the Northwest Forest Plan and some require pre-disturbance surveys for all proposed habitat altering activities. The following provides information about the two pre-disturbance survey species in the Project Area and their habitat relationships, their likelihood of occurrence in the Project Area and, if surveyed for, the results of the surveys and management recommendations for protection of known sites.

Vertebrates

The only Survey and Manage vertebrate on the Siuslaw National Forest is the red tree vole (*Abrorimus longicaudus*). Its habitat association is mature and old growth conifer forests. In the northwest corner of Unit 15 approximately five acres is considered suitable habitat. Surveys were conducted on March 10, 2004 using the Individual Tree Examination Survey Method of the *Red tree vole protocol* (Version 2.2) within this area and no evidence of red tree voles was found in the area.

Mollusks

There are three species of survey and manage mollusks on the Siuslaw National Forest. They are Puget oregonian (*Crytomastix devia*), evening fieldslug (*Deroceras hesperium*), and Oregon megomphix (*Megomphix hemphilli*). The Puget oregonian inhabits mature to late successional moist forest and riparian zones, under logs, in leaf litter, around seeps and springs, and often associated with hardwood debris and leaf litter and/or talus. It is often found under or near big-leaf maple and may be under sword-fern growing under these trees, or on the underside of big-leaf maple logs. The evening fieldslug is associated with wet meadows in forested habitats in a variety of low vegetation litter and debris; rocks also may be used. Little is known about this species and its habitat. The Oregon megomphix inhabits moist conifer/hardwood forests up to 3000 feet. A big-leaf maple component and an abundance of sword-fern on forested slopes and terraces seem characteristic. This species is somewhat photophobic, preferring a moist habitat under forest litter, and is seldom found active on the surface. Typically, it is associated with big-leaf maple litter and is commonly found between layers of partially decomposed leaves. There is no suitable habitat for *Crytomastix*, *Megomphix* or *Deroceras*, therefore no surveys are needed.

Management Indicator Species

Siuslaw National Forest Plan (USDA 1990) MIS species are those that represent a larger group or guild of species that are thought to be indicators of habitat change. The MIS species on the Siuslaw Forest include marten for mature older age stands, northern spotted owl for old growth conifer communities, pileated woodpecker for large snags and defective trees, primary cavity nesters (i.e. downy and hairy woodpeckers, red-breasted sapsucker, flicker, and red-breasted nuthatch) for small to medium size dead and defective trees, and ruffed grouse for hardwood and deciduous mixed habitats.

Effects to MIS from the proposed action include: The proposed action occurs outside mature forest stands, management activities are not expected to have negative impacts on local populations or habitats of American marten or pileated woodpecker, which have been identified to indicate health of late and old growth forests. Primary cavity nesters and ruffed grouse may be temporarily displaced by the disturbance activities of the mechanical operations but are not expected to abandon the Project Area. Beneficial effect is expected to occur as more snags would be created.

Neo-Tropical Migratory Birds (Land Birds)

Landbirds, including migrant and resident species, are those that generally use terrestrial and wetland habitats. Habitats these species could be found using include forest canopies, snags, understories, ground vegetation/structure, existing openings and a wide variety of structural types and successional stages. Some landbirds expected in the Project Area include olive-sided flycatcher, tree swallow, Swainson's thrush, varied thrush, winter wren, warbling vireos, and purple finches. Impacts to landbirds can come from either disturbance or habitat alteration or both. Impacts from disturbance are due to activities above normal ambient levels proximate to nesting or feeding areas. Alternative 1 would have no disturbance impact on any landbirds because no activities are planned. Alternative 2 and 3 have planned activities that could occur during the later portions of the breeding season for some species that would potentially be proximate to nesting and feeding sites. Since the planned activities would occur during the later part of the nesting season, and many of these species nest multiple times over the spring-summer period, only the very last nesting would potentially be disturbed allowing for at least one or possibly two clutches to be successful even during years of disturbance. Disturbance from flushing from feeding sites would have far less potential impact to landbirds than nesting disturbance. Feeding birds have much greater flexibility to locate and feed elsewhere when contrasted with fixed nest location. Overall, the number and location of alternative feeding sites in the geographic area described above further reduces the likelihood of actually incurring any measurable feeding disturbance.

Impacts to landbirds would also come in the form of habitat alternation. All alternatives would impact landbirds. The thirty to forty five year old managed stands are dense, even-aged stands. The number of stems per acre range is 180 to 350. The trees are tall and thin, have relatively uniform bole diameters, and have few branches over one inch in diameter. These stands, typically have 85 to 95 percent crown closure, very little light reaches the forest floor, or the understory. The understory typically contains salmonberry, sword fern, huckleberry, Oregon grape and salal. Alternative 1 would impact landbirds that are adapted to a more open canopy and larger diameter trees. Alternative 2 and 3 would impact existing species associated with closed canopy and high density trees per acre. Landbirds that found an ecological niche in a more open habitat with smaller diameter trees would benefit from both action alternatives. Landbirds that have specialized in only tightly closed canopy, small diameter trees, would be adversely impacted by both action alternatives.

Since the project would occur during the land bird nesting season, there is potential for nesting disruption or harm to young of the year. However, due to the small number of individuals that might be impacted, negative impacts to local populations of land birds within the drainage are not expected. No intentional take of migratory birds would occur under this project.

Fish Species

Introduction

The following information is summarized from the *Biological Evaluation for the Windjammer Project, July 20, 2004*. The Windjammer Project occurs within the area covered in the Drift (Siletz) Watershed Analysis (September, 1996). The lies between the drainages of the Salmon River and Siletz River and drains into Siletz Bay. The Project Area is located in the Drift (Siletz) 5th field Watershed. The proposed actions would occur in portions of two 6th fields (Schooner Creek, Lower/Drift Siletz). The analysis area is the Drift (Siletz) 5th Watershed. The analysis area consists of 48,000 acres which drain to the Pacific Ocean. The eastern part of this area is composed primarily forest land of mixed and federal and private ownership.

Existing Condition and Trends

The following table gives an estimated number of perennial and intermittent stream crossings by 6th field watershed for the Windjammer Project.

6th Field Sub-watershed	*Perennial Crossings	*Intermittent Crossings	Total Crossings
Schooner	0	0	0
Drift(Siletz)	20	7	27

*Developed from the Forest GIS database and field review.

All roads used to access thinning units within the Schooner Creek Watershed are ridge-top roads with no stream crossing culverts. Of the 20 perennial stream crossings, 3 are located on the paved portions of the haul route (Road 1700). The remaining 17 perennial stream and all intermittent crossings are located on crowned, aggregate roads with ditches and ditch-relief culverts.

This section discusses the effects of the alternatives on the following:

Common Name	Species	Status
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	Sensitive Species
Chum Salmon	<i>Oncorhynchus keta</i>	Sensitive Species
Coastal Steelhead	<i>Oncorhynchus mykiss</i>	Sensitive Species
Coastal Cutthroat Trout	<i>Oncorhynchus clarki clarki</i>	Sensitive Species
Coho Salmon	<i>Oncorhynchus kisutch</i>	Management Indicator, ESA proposed and Sensitive Species

Analysis of Direct and Indirect Effects

Alternative 1 No Action

The two effects of this alternative that may affect these species are: 1) Sediment from roads that may occur due reduced maintenance. Exactly how much sediment is being produced is not known at this time. The District does not anticipate it would receive the funding needed to do a comprehensive sediment review for this watershed, as the cost would be very high. 2) Delay in the development of

large conifer trees that would be a source of large woody debris. The Drift (Siletz) Watershed has identified degraded Fish Habitat as one of Issues (3.3 p17) in the basin. The lack of Large Woody Debris (LWD) is a key component in this degraded habitat. This lack of LWD could also be a root cause for the lack of pool structure in the streams. The delay in the development of the large conifers would continue this effect.

Alternative 2 Proposed Action

Chinook salmon

Chinook salmon utilize the watershed for spawning and rearing. Adult Chinook spawn in the late fall in the mainstems of the streams in the basin. The eggs incubate in the gravel and in the spring the young migrate down to the Siletz estuary. The young reach the estuary by early summer and then spend the summer rearing in the estuary. The project activities are occurring in the forested upper portions of the watershed. The design criteria (mitigation measures) listed on EA pages 13-17 would minimize the possibility of sediment impacting this species.

Chum Salmon

Chum salmon utilize the lower watershed for spawning. This area is on the southern fringe of the range of cum salmon. Chum salmon spawn in late fall and the juveniles migrate immediately upon emergence. They spend a brief time (~2 weeks) in the estuary and then migrate into the ocean. The project activities are occurring in the forested upper portions of the watershed. The design criteria (mitigation measures) listed on EA pages 13-17 would minimize the possibility of sediment impacting this species.

Coastal Steelhead

Steelhead of all life history stages can be found in the Project Area at various times. Steelhead utilizes these watersheds for both spawning and juvenile rearing. In freshwater Steelhead need clean gravel for spawning, and cool temperatures. Ideal conditions include off channel rearing habitat, and pools with complex Large Woody Debris (LWD). According to the Drift (Siletz) Watershed Analysis both the Lower Drift and Schooner 6th fields are deficient in LWD. The goal of the Windjammer Restoration Project is to accelerate the development of Late Successional habitat. This would facilitate the development of large trees in the riparian areas to increase the potential supply of future LWD. In the long term this should lead to improved habitat for Steelhead. The project activities are occurring in the forested upper portions of the watershed. The design criteria (mitigation measures) listed on EA pages 13-17 would minimize the possibility of sediment impacting this species.

Coastal Cutthroat Trout

Cutthroat has a complex life history pattern including both resident and anadromous populations. Cutthroat of all life history stages can be found in the Project Area at various times. Cutthroat utilizes these watersheds for both spawning and juvenile rearing. In freshwater Cutthroat need clean gravel for spawning, and cool temperatures. Ideal conditions include off channel rearing habitat, and pools with complex Large Woody Debris (LWD). According to the Drift (Siletz) Watershed Analysis both the Lower Drift and Schooner 6th fields are deficient in LWD. The goal of the Windjammer Restoration

Project is to accelerate the development of Late Successional habitat. This would facilitate the development of large trees in the riparian areas to increase the potential supply of future LWD. In the long term this should lead to improved habitat for Cutthroat. The project activities are occurring in the forested upper portions of the watershed. The design criteria (mitigation measures) listed on EA pages 13-17 would minimize the possibility of sediment impacting this species.

Coho Salmon

Coho utilize these watersheds for both spawning and juvenile rearing. In freshwater Coho need clean gravel for spawning, cool temperatures, and suitable habitat for~ 16 months of freshwater rearing. Ideal rearing conditions include off channel rearing habitat, and pools with complex Large Woody Debris (LWD). Coho numbers in the Oregon Coast ESU have been depressed, but are showing signs of recovery. Coho are present in both the Lower Drift and Schooner 6th field.

According to the Drift (Siletz) Watershed Analysis both the Lower Drift and Schooner 6th fields are deficient in LWD. The goal of the Windjammer Restoration Project is to accelerate the development of Late Successional habitat. This would facilitate the development of large trees in the riparian areas to increase the potential supply of future LWD. In the long term this should lead to improved habitat for Coho. The design criteria (mitigation measures) listed on EA pages 13-17 would minimize the possibility of sediment impacting this species.

Alternative 3 No Temporary Road Construction

This alternative differs from the Proposed Action alternative in that no temporary roads would be constructed. This would affect portions of units 2, 4, 9, 13, 15, 19, 21, 22, and 31 totaling about 62 acres. The only treatment of these areas would be to create about 10 snags and cut 10 trees for down wood per acre. The other commercial units that have existing access, including Forest and existing temporary roads, would be treated as described in the Proposed Action alternative.

Effects of this alternative would be similar to the effects of the proposed actions due to the similarity of the actions. If anything the effects would be less due to the smaller amount of road activity. The lack of road building eliminates any possibility of mobilizing sediment from construction activities. This alternative would move the area towards Late Successional characteristics, but at a slower rate due to the smaller acreage thinned.

Cumulative Effects

The Forest Service owns 59 percent of the watershed. Since the Forest Service is only conducting thinning sales for habitat enhancement, the low impact of this type of activity should result in minimal cumulative effects of sediment. Previous thinning projects in other portion of the watershed have treated about 370 acres of commercial aged stands and most of the of the younger aged stands in Drift Creek and some in Schooner Creek watersheds have been precommercially thinned, with the goal to develop larger conifer trees faster. Future projects may include road closures that would reduce sediment, other thinning projects that have the same goals as the proposed action, and a placement of large conifer trees in Sampson Creek to improve habitat.

Other Activities on National Forest System Land-- The other foreseeable routine actions, which may include noxious weed control, road maintenance, administrative road use, public recreational use, and small forest products gathering for personal use. These activities do not involve the use of heavy equipment other than on existing road surfaces. Based on the types and extent of these uses in the Windjammer Project Area, no detrimental soil disturbance is anticipated.

State, BLM and Private Land---The activities on these land ownerships are difficult to quantify. Most of the private land management in the watershed consists of removing forest product, primarily by clearcutting. These actions are guided by the Oregon Forest Protection Act. This act requires streams to be buffered. However, the conifer stands on private land are managed for short rotations, so the development of large conifer trees does not occur. The BLM manages the land similar to the Forest Service.

Direct/Indirect Effects on Essential Fish Habitat

The Magnuson –Stevens Act designated Essential Fish Habitat for coastal coho and Chinook populations. The project is designed to avoid adverse impacts on this designated habitat.

Heritage

The following information is summarized from the *Pre-project Heritage Resource Inventory of Windjammer Thin Project, February 19, 2004* report. For the proposed commercial thinning, and under planting, no cultural or historic sites were found in the commercial thin units by surveys conducted in FY 2002. Surveys for road stabilization, are not needed because either the sites have been previously disturbed or the areas that may be affected are small and in areas where such sites are not located.

Project implementation would cease if any cultural resource sites were located. Documentation, evaluation, and consultation with the Oregon State Historic Preservation Officer (SHPO) would be required for the archaeological property before ground-disturbing activities would be allowed to proceed in the Project Area.

Economics

This section focuses on the money that may be generated from the commercial harvest and how this action may benefit the local communities and counties, and the road decommissioning costs. The information is a summary of the *Windjammer Economic Analysis, March 30, 2004*. For the commercial harvest, two harvest systems are planned: Skyline (cable) and tractor and/or horse. In general, tractor harvesting is the most cost efficient and skyline harvesting is the next most cost efficient.

The wood manufacturing industry, including acquiring raw materials, is an important source of employment and income for residents of Yamhill, Lincoln, and Tillamook counties. These jobs, typically, pay a higher rate than the average and provide a way of life. Typically, commercial thin projects such as the proposed action are purchased by local industries and provide year around or nearly year around employment. In addition to predicted economic benefits, there are future monetary benefits that cannot be calculated in the present. For example, fisheries and riparian enhancement projects would affect the local economy by providing increased numbers of fish and wildlife, which would result in more recreational use of the area. It is also extremely difficult to establish a value of some of the project's direct and indirect benefits and costs (i.e. the value of providing habitat for nesting marbled murrelets)

For the purpose of this analysis, three factors would serve as indicators to compare the economic effects of the alternatives:

1. Acres Treated - Numbers of acres treated.
2. Volume harvested - The total CCF (hundreds of cubic feet) being harvested.
3. Revenue generated—that includes a discussion of the net gain or loss that may occur.

Alternative 1 No Action—No revenues would be generated to fund programs such as forest road maintenance, watershed enhancement projects. Approximately 47,640 CCF (1 CCF equals 100 cubic feet of wood fiber) of timber, in need of thinning, would be unavailable to aid in meeting the public demand for wood products. In addition, loss of potential growth by not treating these forest stands would contribute to a future loss of federal timber receipts. In addition, approximately \$130,000.00 invested by the Forest Service for planning, public scoping, and environmental analysis would be lost.

Alternatives 2 This alternative would commercially thin about 962 acres and yield approximately \$6,037,000 gross revenue. The estimated total costs are \$2,158,000. The estimated net gain of \$3,800,000 could be used for other watershed enhancement projects, road closures and Forest Road improvements. The economy of the local area would also benefit by opportunities for employment.

Alternatives 3 This alternative would commercially thin about 900 acres and yield approximately \$5,650,000 gross revenue. The estimated total costs are \$2,007,000. The estimated net gain of \$3,650,000 (about 5 percent less than Alternative 2) could be used for other watershed enhancement projects, road closures and Forest Road improvements. The economy of the local area would also benefit by opportunities for employment.

Air Quality

Smoke emissions from slash burning would result in short term effects to visibility within the immediate proximity of the piles and to a lesser degree down wind. Initially smoke would be lofted up by convective heat and be transported out of the area by wind currents. The effects of these emissions would depend largely on transport winds and mixing heights. These factors are analyzed daily and approvals to and burning instruction are issued by the Salem Smoke Management Office.

All burning activities would adhere to the requirements of the Federal Clean Air Act for the Prevention of Significant Deterioration and comply with the Nation Ambient Air Quality Standards, and visibility protection. Smoke production would not exceed PM10 emissions level described in the State Implementation Plan of the Oregon Smoke Management Plan. Dust from traffic associated with the proposed actions may temporarily decrease air quality.

Scenic Resources

The scenic quality within the Windjammer Project Area is valuable to local residents and forest visitors. High quality scenery is generally described as naturally-appearing, aesthetic landscapes. Scenic resources are qualitative in nature and include the physical, biological, and cultural attributes that give a particular place meaning and value to viewers. Landscape character contributes a sense of place for people. However, one person's viewing experience may not reflect another's perspective from the same vantage point.

The Siuslaw National Forest uses Visual Quality Objectives (VQOs) to assess both landscape quality and how proposed activities might change the visual quality of a landscape. The Windjammer Project Area is included in those areas with a VQO of modification. The proposed actions would not dramatically affect this resource.

Recreation

Introduction

For discussion purposes, recreation is divided into three categories: **Developed, Dispersed and Wilderness/Roadless**. Developed recreation examples are campgrounds, trails and trailheads, ski areas etc. Dispersed recreation includes those numerous activities that occur outside developed recreation sites. Examples are camping outside developed campgrounds, sightseeing, rock climbing, hunting, fishing, gathering special forest products etc. Wilderness areas are areas set aside by Congressional action. These areas are typically large primitive areas with limited access. Dispersed recreation activities can occur in these areas. Most do not have developed facilities within them. Roadless Areas may contain wilderness characteristics, but have not been officially designated by Congress. Typically, they are a Management Area in Forest Plans. The Forest Plan determines whether these areas should be recommended for wilderness designation. In the Windjammer Project Area there are no developed recreation sites, Wilderness or Roadless Areas. The characteristics of the Project Area were reviewed during the various Roadless Area reviews and determined not to have the characteristics of Roadless Areas. No developed recreation sites are planned for this Area.

Existing Condition and Trends

Paved state and county roads provide access to the Windjammer Project Area. This plus the relatively good condition of paved Forest Road 17 and the other Key Forest Roads make the Area relatively easy to access by a variety of vehicles.

The factors that affect recreational use in the area are weather, condition of roads, and the type of activity. Types of activities include a variety of dispersed recreation activities, one developed trail system, Drift Creek, and one organizational camp. Presently, the existing open Forest road system makes about forty percent of the area accessible for dispersed recreation activities. This estimate assumes that most activities are restricted to within an average of 200 feet of the roads, due to the steep, brushy terrain that limits cross-country or off road travel.

The amount of use and quality of the recreation experience is difficult to quantify, because of the variety uses that occur in the area. However, several patterns are evident:

- A. Most of the use occurs during the summer and fall months. However, the Drift Creek trail system and the camp see use year around. Dispersed camping occurs on or along most of the open Forest roads. Most of this use is centered around fishing in Drift Creek.
- B. The conditions, maintenance and location of the roads greatly influences dispersed recreational uses, use of the Drift Creek and the organizational camp. The relatively good condition of the Key Forest roads allows a variety of vehicles to use them. The 17 Road for example is in good enough condition for passage by trucks towing trailers, and cars. The Maintenance Level 2 and those Maintenance Level 1 roads that are not closed are, generally, only passable by two and 4-wheel

drive high clearance vehicles. ATVs and motorcycles can use most of the open roads in the area. The extensive road system and its condition provide the opportunity for people to find some solitude.

Climate and terrain influence the conditions of the roads in the Area. Due to high amounts of the rainfall, steep slopes with unstable soils, requirements to protect aquatic and wildlife resources and rapid growth of vegetation the roads need regular maintenance.

C. The demand for recreational opportunities is expected to increase an estimated 1 to 2 percent per year on the Siuslaw National Forest. Exactly how much this affects the Windjammer Project Area is not quantifiable.

Analysis of Direct and Indirect Effects

The amount and kinds of recreational uses that may occur in the Project Area is directly related to the amount and condition of the Forest Roads.

Alternative 1 No Action

In this alternative, Forest roads would be maintained as available funds allow. It is expected that some of the roads would close due to rapid vegetation growth as there is not enough funds to maintain all of the drivable Forest roads in the Project Area. The Key Forest roads should receive some maintenance, but there may not sufficient funds to maintain them to existing condition in the long term. As roads become closed some recreational opportunities would be reduced. Exactly how much is not quantifiable because it is impossible to determine which roads would close or to what extent, and what influence this would have.

Alternative 2 Proposed Action

The effects of this alternative are about the same as the No Action alternative. There may be slight improvement in the condition of those Forest Roads used for timber haul as some of the funding from the commercial sale(s) would be used to maintain these roads in their present condition. Additional funds may available from these sale(s) to make slight improvements in these roads. These improvements may include replacing old culverts, cleaning drainage ditches and resurfacing the some of the gravel travel surfaces.

Alternative 3 No new Temporary Roads

The effects of this alternative are about the same as the Proposed Action.

Recreation-Cumulative Effects

The cumulative effect on recreation over time depends how many drivable Forest roads become closed. It is expected that amount drivable Forest roads would decrease over time. Exact amount of this decrease or its total effects are difficult to quantify as it is uncertain which roads would become closed.

Environmental Justice

The action alternatives were assessed to determine if there would be a disproportionately impact to minority or low income populations, in accordance with Executive Order 12898. The areas that may be influenced by the proposed activities are Lincoln and Tillamook Counties, Oregon. Based upon census information from the State, Native Americans are the only minority group in these counties whose population level is higher than the state average. They were contacted about the proposed activity during the scoping process. They did not comment on the project. Since these activities are small in size and duration, it appears that Native Americans would not be adversely affected.

The poverty level in Lincoln County, based upon State information, is above the state average. This means the number of families in the county that have incomes below the state's poverty level is higher than the state's average. For Tillamook, this is reversed. Articles discussing the project were placed for two weeks in each of the county's newspapers. These activities if done may provide some employment to these families. However, the effects would be temporary, because these activities are small in size and duration.

Vegetation Management

The potential risks associated with any competing vegetation control activities are discussed at length in the Region 6 Final Environmental Impact Statement for Competing and Unwanted Vegetation and in the supplemental volume entitled "Characterization and Management of Risk" (R6 FEIS). Potential risks for the Windjammer Project Area are expected to be similar to those described in the R6 FEIS. Potential health effects would also be minimized by following mitigation measures described in Chapter II of the R6 FEIS and following requirements of the Forest Service "Health and Safety Code Handbook".

Site-specific vegetation management analysis was conducted and documented only for noxious weed and conifer release associated with under-planting in accordance with the Region 6 Environmental Impact Statement for Managing Competing and Unwanted Vegetation (FEIS) and Mediated Agreement dated May 24, 1989. Provisions of the FEIS do not apply to commercial and precommercial thinning. This analysis is available for public review during the 30-day comment period for this EA.

None of the alternatives propose the use of herbicides or broadcast burning. Chainsaw removal of brush may be done to release under-planted trees. Noxious weed control would be accomplished by pulling or cutting with chainsaws, or release of natural controls (e.g. flea beetle releases to control Scotch broom).

Special Forest Products

Special Forest Products include harvest of forest products such as moss, Christmas trees, and mushrooms and many types of plants for a variety of uses. They are sold both for personal and commercial uses. The Hebo Ranger District is divided into areas that are designated for these uses. A rotation has been established so that these areas are rested for some period of time to allow the resources to recover. This rotation also allows for a sustained use or production of these products.

There are commercial businesses that focus on gathering these products. Many are minority-owned businesses located in the Willamette Valley. Since the Forest Roads provide access to these areas, and the trend is for less drivable Forest Roads, it is expected that there would be less opportunity to gather these products.

Fire and Fuels

Existing Condition

The following information is summarized from the *Fire and Fuels report for the Windjammer Thin, April 19, 2004*. This report is located in the Windjammer Project analysis file. The fire occurrence in the sale area is relatively low, but the potential for a very damaging wildfire does exist when conditions are right. The highest potential for ignition is the human factor, for example fires are more likely to be started by recreational users of the forest, commercial activity, and arson. Most if not all lightning is accompanied by a significant amount of rainfall, sufficient to reduce the probability of wildfire ignition.

Access and response time of initial attack. Given the reduced accessibility of many of the temporary spur roads, and several of the ridge roads due to closures, in-grown vegetation, and waterbars; response time by initial attack crews is increased.

Direct and Indirect Effects of the Alternatives

Alternative 1 No Action

In this alternative no thinning would be done. The closure, over time, of some of the Forest roads may hinder fire management and suppression actions if there is a fire.

Alternative 2 Proposed Action

Thinning in the managed stands would result in an increase of fuels on the forest floor from the harvest activities. The fuels are expected to decay over time, decreasing the risk of wildfires. Past thinnings have had a window of three to four years in which the stand is capable of supporting a surface fire. The expected amount of logging slash and coarse woody debris created would be low to moderate.

Typically, thinning slash levels are sufficient to support a surface fire for several years following harvest. In addition, with the reduced overhead canopy the brush is likely to increase growth, which adds to the live fuel loading. Similarly, as the canopy is opened up, dead fuels, duff, and surface vegetation would be dried out, lowering the fuel moisture and increasing the flammability.

Fire behavior coming from these types of fuel loadings under dry late summer time conditions, would put off fireline intensities and flame lengths that would most likely be beyond the capability of direct attack by initial attack resources.

Expected fire intensity is likely to be higher as the fuel loading is increased. As a result, cumulative impacts to other resources would also increase with higher fire intensities. There could be damage to soils by burning off nutrients and organic matter, which would increase the potential for overland flow. The severity of the damage is directly linked to the intensity of the fire.

Alternative 3 No New Temporary Roads

In this alternative about 62 acres would not be thinned. Therefore, the effect of this alternative is some what less than the Proposed Action alternative.

Cumulative Effect

The highest risk of an unplanned ignition would occur when the thinning slash is present near drivable Forest roads. The highest risk would occur if all the units were thinned in the same year or two. However, this is not the case. These thinnings are planned to occur over a 5 to 7 year period which lessen the risk over time. Also, the risk is reduced further by piling and burning the slash along these Forest roads. The cumulative effect of the Forest roads closing over time is not quantifiable.

Accomplishing activity fuel treatment projects in the units adjacent to major travel routes would reduce the threat to wildfire as would additional fire prevention, warning signs, and a higher emphasis during fire watch and patrolling while interacting with the public.

Chapter 4 Probable Environmental Effects That Cannot Be Avoided

Implementation of any alternatives may result in some adverse environmental effects. The severity of the effects can be minimized by adhering to the Design Criteria listed in Chapter 2, Forest Plan Standards and Guidelines and Best Management Practices. If management activities occur, however, some effects cannot be avoided. Even the No Action alternative has effects.

Cultural Resources

There is no assurance that every cultural resource site would be located in advance of all planned management activities. Some ground-disturbing activity may affect an undiscovered historic or prehistoric site. Sites discovered in this manner would be immediately protected from further disturbance.

Wildlife

Some disturbance may occur due to activities occurring during the murrelet and spotted owl nesting seasons. The continual use of open Forest Roads may disturb some wildlife species.

The quantity and quality of late-successional habitat may be reduced due to delayed development and/or no change in stand structure of those young managed stands that are not treated.

Air Quality

Temporary seasonal effects on air quality are unavoidable under any of the action alternatives, due to dust from traffic associated with them and smoke from burning slash piles. These effects would be temporary.

Soil Resources

Under the action alternatives, some soil displacement and compaction is expected due to road stabilization, temporary road construction, hauling logs on roads, maintenance of open Forest Roads and ground based equipment and horse yarding.

Vegetation—Young Managed Stands

In the no action alternative the young managed stands would not be treated, which means either the development late-successional characteristics may never occur or at least be delayed. This may result in the indirect effect of delayed occupancy of the stands by the northern spotted owl and marbled murrelet, which may result in the delayed increase in these species populations, which is not desired. Commercial thinning would remove some potential coarse woody debris from the system.

Fish species

A slight increase in sediment delivery to streams may occur from road activities and horse or ground based equipment use. The recruitment potential of trees available to provide large wood to streams would increase over time.

Relationship between Short-Term Use and Long-Term Productivity

Short-term uses are those uses that generally occur annually. Long-term productivity refers to the ability of the land to produce a continuous supply of a resource.

Soil Resources

As described in the Soil Resource section of this chapter, proposed activities would result in a decrease in long-term soil productivity for areas where soil is compacted or heavily disturbed. Over time productivity is expected to increase as compaction is reduced and stand treatments improve vegetation growth.

Water Quality

The results of effects analysis indicates that stream channel conditions are expected to be protected, and quality is not expected to be impacted by proposed activities. Short-term effects may occur as described in the Water Quality section of this chapter, however no long term impacts are expected, and the trend on NFS land over time is expected to improve.

Wildlife

Short term—May be disturbance of nesting, and/or fledging murrelets and/or spotted owls by commercial thin activities are anticipated to occur for about 10 years once the operations begin.

Long term development of late-successional habitat should improve murrelet and spotted owl habitat. If the young managed stands are not treated, late-successional “productivity” would be delayed and may not occur.

Vegetation

Harvest of timber would reduce snag and down recruitment in the smaller size classes for several decades in return for speeding up recruitment in the larger size classes and the potential for these stands to be occupied by the northern spotted owl and murrelets sooner.

Air Quality

The temporary impacts of smoke from slash burning and road dust from vehicles associated with proposed activities would have minor, short-term effects on visual quality and recreation use. Minimizing the risks from wildfire offsets for the short-term impacts and long-term, increased site productivity. Slash burning would reduce the risk of wildfire; trading these short term impacts off for long term risk reduction and the associated site productivity impacts of hotter burning wildfires.

Fish species

In the short term there may be a slight increase in sediment in the streams that could potentially impact fish populations and habitat. In the long term, habitat quality due to the input of large woody debris would improve.

Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of resources refers to the loss of production or use of a resource due to a land use decision that once executed cannot be changed. An irretrievable commitment of resources applies to losses of production or use of renewable resources for a period of time.

Soil Productivity

Soil compaction and erosion caused by road building and by timber ground based harvest operations could reduce soil productivity. The time lost in this state of lower productivity is irretrievable, but the soil resource can be rebuilt over long periods of time. None of the alternatives would result in an irreversible commitment of this resource.

Vegetation

Timber harvest would change plant succession, stand development, and species composition. If some of the stands are not treated, the time lost for them to develop late-successional characteristics is irretrievable. If the stands are damaged or destroyed, the time lost for replacement is irretrievable.

Air Quality

The impact of slash burning and road dust would have temporary seasonal impacts on the air quality in all alternatives except Alternative 1 (No Action). Reduction of air quality would constitute a short-term irretrievable resource impact.

Wildlife

The loss or modification of habitat for certain wildlife species is an irretrievable commitment of resources. As vegetation recovers, this habitat would recover.

Cultural Resources

Any activity that disturbs a cultural resource may be an irreversible and usually irretrievable commitment of these resources.

Required Disclosures

Effects of Alternatives on Social Groups: There would be no overall differences between alternatives in effects on minorities, Native American Indians, women, or the civil liberties of any American citizen.

Effects on Floodplains and Wetlands: There are wet meadows, and ponds within the Windjammer Area. These wetlands would be buffered should not experience any significant adverse effects from management activities. The floodplains within the Windjammer Area would not receive measurable impact by upstream influences. Management activities designed to protect these resources conform to the federal regulations for floodplains (Executive Order 11900) and wetlands (Executive Order 11990).

Energy Requirements and Conservation Potential of Alternatives: The energy required to implement the alternatives in terms of petroleum products would be insignificant when viewed in light of the production costs and effects on the national and worldwide petroleum reserves.

Effects of Alternatives on Prime Rangeland, Forest Land, and Farm Land: The alternatives presented are in compliance with Federal Regulations for prime lands. The definition of prime forest land does not apply to lands within the National Forests. No federally-managed land in the Windjammer Area is classified as rangeland. In all alternatives, Federal lands would be managed with the appropriate consideration to the effects on adjacent lands.

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Windjammer Commercial Thin Transportation and Haul Route Report, March 18, 2004 author: Ken McCall, Transportation Planner, Siuslaw National Forest.

Windjammer Project, Soils and Hydrology Report, January 26, 2004; author: Kami Ellingson, District Hydrologist, Hebo Ranger District.

List of Preparers

Forest Service Interdisciplinary Team

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John Casteel	Hebo Ranger District, Siuslaw NF	Fisheries
Ken McCall	Supervisor Office, Siuslaw NF	Transportation Planner
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Dan Segotta	South Zone, Siuslaw NF	Forest Botanist
Pat Babcock	Supervisor Office, Siuslaw NF	Economics/Sale appraisals

Additional support and review provided by:

Rich Babcock	Hebo Ranger District, Siuslaw NF	Cultural Resources
Frank Davis	Supervisor Office, Siuslaw NF	NEPA Coordinator

List of Agencies and Persons Consulted

NOAA Fisheries

The National Marine Fisheries (NMFS) proposed listing the Oregon Coast (OC) coho salmon evolutionarily significant unit (ESU) as threatened under Endangered Species Act, (ESA) and proposed issuing protective regulations under Section 4(d) of the ESA in June 14, 2004. Pursuant to the Magnuson-Stevens Act, (MSA) the Pacific Fisheries Management Council designated essential fish habitat (EFH) for the Federally-managed Pacific salmon, including coho and Chinook salmon in May 2000.

Since Coho salmon are proposed for listing as a Threatened and Endangered species, the Forest Service conferences with NOAA to determine if the design criteria (mitigation measures) listed in this EA are adequate protect the species and its habitat until the listing decision is made. The Forest Service submitted the Windjammer Project Biological Assessment, February 3, 2005 to NOAA fisheries. In their conference letter, dated March 3, 2005, NOAA fisheries concurs with the conclusion in the Biological Assessment that the effects of the proposed action, when added to the baselines and combined with other actions, is unlikely to cause adverse effects or incidental take of OC salmon or adverse effects to proposed critical habitat, and because the habitat requirements for MSA managed species in the project area are similar to that of the ESA listed species, and because the conservation measures that are included as part of the proposed action to address ESA concerns are also adequate to avoid, minimize, or otherwise offset potential adverse effects to designated EFH, conservation recommendations to meet MSA are not necessary.

U.S. Fish and Wildlife Service

In their biological opinions of the following Siuslaw National Forest biological assessments, the U.S. Fish and Wildlife Service (FWS) has concurred with our findings that the project will not jeopardize the existence of bald eagles, northern spotted owls, and marbled murrelets. The FWS terms and conditions will be applied to the project design criteria:

- Programmatic Biological Assessment of Fiscal Year 2003-2004 Projects in the North Coast Province Which Would Modify the Habitats of Bald Eagles, Northern Spotted Owls, or Marbled Murrelets. FWS biological opinion reference #: 1-7-02-F-958.
- Programmatic Biological Assessment of Fiscal Year 2004-2005 Projects in the North Coast Province Which May Disturb Bald Eagles, Northern Spotted Owls, or Marbled Murrelets. FWS biological opinion reference #: 1-7-02-F-1113.

Native Americans

The Confederated Tribes of Coos and Lower Umpqua, the Confederated Tribes of Grand Ronde and the Confederated Tribes of the Siletz were informed of the proposed action during scoping. No comments on the proposed action were received from these tribes.

Appendix

A. Project Files located at the Hebo Ranger District

Analysis Reports

Windjammer Commercial Thin Transportation and Haul Route Report, March 18, 2004
author: Ken McCall, Transportation Planner, Siuslaw National Forest.

Windjammer Project, Soils and Hydrology Report, January 26, 2004; author: Kami
Ellingson, District Hydrologist, Hebo Ranger District.

Plant Biological Evaluation for the Windjammer Project, Hebo Ranger District, April 3,
2004, author: Dan Segotta, Siuslaw Forest Botanist.

Fuels and Fire Assessment, Windjammer Thin, April 19, 2004, author: Nathan Pearson,
fuels and fire technician, Hebo Ranger District

Botanical Resources Assessment, Windjammer Project, May 12, 2004: author: Dan
Segotta, Siuslaw Forest Botanist

Economic Analysis, Windjammer Project, March 30, 2004

Pre-project Heritage Resource Inventory of Windjammer Thin Project, February 19, 2004

Biological Evaluation for the Windjammer Restoration Project, July 20, 2004; author:
John Casteel, District Fish Biologist, Hebo Ranger District.

Biological Evaluation and Wildlife Report for Windjammer Thin, June 10, 2004: author,
Janet S. Moser, District Wildlife Biologist, Hebo Ranger District

Silvicultural Prescription-Windjammer Project, October 12, 2004, author John Johansen,
District Silviculturist, Hebo Ranger District

Biological Assessment (Fish species)—Windjammer Project, February 3, 2005, authors:
John L. Casteel, Fishery Biologist, Hebo Ranger District; Kami Ellingson, Hydrologist,
Hebo Ranger District.

United States Department of Commerce, National Oceanic and Atmospheric
Administration, National Marine Fisheries Service, Letter-Endangered Species Act
Section 7 Informal Conferencing and Magnuson-Stevens Fishery Conservation and
Management Act Essential Fish Habitat Consultation for the Windjammer Project, Lower
Drift Creek and Schooner Creek Subwatersheds, Lincoln County, Oregon; dated March
3, 2005

B. Other Issues

Introduction

The following are the comments and concerns received during scoping that were determined to be non-significant issues, because: 1) They are covered by the significant issue discussed in Chapter 1. 2) They are covered by design criteria discussed in Chapter 2. 3) Do not address specific aspects of the proposed actions and, therefore are irrelevant to the decisions that may be made. 4) The anticipated effect(s) of the concern is not considered sufficiently significant that development of an alternative is required. The issue or concern is listed and with it is a reason or reasons why it is not considered significant.

Gary Blanchard

1. You should be clearcutting your Swiss needle cast infected stands.

Discussion: We agree that Swiss needle cast affects stand growth. However, as discussed in Chapter 3, page 36, Swiss needle cast is not expected to have a long term or significant effect on stand development, because the current Swiss needle cast severity in the stands is characterized as generally “low” (2.6 to 3.5 years of needle retention) or moderate (1.6 to 2.5 years of needle retention). Therefore, measures such as clearcutting and thinning down to 30 trees per acre and underplanting do not appear to be warranted at this time as the most efficient way to develop the desired stand characteristics.

W. Pearcy

1. The goal of achieving late-successional habitat is excellent. However, care should be taken to avoid logging on unstable uplands near Drift Creek.

Discussion: We are also concerned by the effects of the proposed actions may have on unstable areas. In response to this concern, we have excluded these areas from logging or road construction.

2. Also, the largest trees should be saved in the riparian zone of both permanent and temporary streams.

Discussion: We agree it is important to not only protect the trees in these areas, but also the integrity of the streams in this Project Area. To do this, project design includes buffers to protect the trees and streams of both permanent and intermittent (temporary) streams. No harvest of trees would be done in these buffers. Some smaller trees may be cut and left in these buffers as an effort to grow larger trees as a source of large coarse woody debris that is presently lacking in the Project Area.

3. Decommission all roads subject to blowouts.

Discussion: We have reviewed the roads affected by the Project and found them to be stable. We do plan as part of this project to improve the condition of the Forest Roads by adding some ditch relief culverts and gravel to the road surfaces. This should enhance their stability and use over the long term. The closed Forest and temporary roads would be stabilized and closed to public travel. This would insure they remain stable.

George R and Ann Bodyfelt

1. We are concerned how poorly access roads have been left to deteriorate. If there is a big burn fire containment/control would be hindered by (lack of) access.

Discussion: The proposed actions do not significantly affect the drivable roads in the area. The changes that may be needed to keep additional roads open for fire management are outside the scope of this Project.

Carol Bickford

Nestucca/Neskowin Watershed Council

1. It is more important for owls to have down wood and snags throughout the units (with emphasis on larger trees on the unit edges) than it is to have everything concentrated in the riparian zone.

Discussion: Snags and down wood would be created in some of the units and portions of the stands.

2. The other thing to consider is thinning heavily (while meeting murrelet guidelines along the unit edges) in some of the stands so that you don't have to do another entry in 20 or so years. Consider closing the roads and walking away from a few of the units.

Discussion: Several of the stands would be thinned to approximately 60 trees per acre which should postpone reentry for at least 20 years. Unit 31 would be heavily thinned and the road decommissioned.

3. Need to maintain shade in riparian areas for sensitive species of salamander (Southern torrent salamander).

Discussion: Although no surveys have been conducted, there is a high likelihood that Southern torrent salamander occurs in the vicinity of the proposed action. Project design includes a minimum buffer of at least 30 feet on perennial streams and greater in some areas providing adequate protection for the species if present.

City of Lincoln City

1. One area of concern is the potential for both chronic and catastrophic soil erosion after logging. It is our understanding that most if not all of the soils in the areas proposed for logging are known to be highly erodible. For example the predominate soil in the proposed logging areas is known as Klootchie-Neotsu silt loam and is described as having rapid runoff and high water erosion hazard. Another soil is the Neotsu-Necanicum complex, is described as having very rapid runoff and very high water hazard. Chronic erosion from exposure of these soils through logging likely would result in decreased water quality, increased expense in operations at our water treatment plant and possible damage to the City's water intake structures. The environmental assessment of the Windjammer Project should address erosion issues in detail, including soils, slopes and erosion-prevention actions that would be taken, if any.

Discussion: We are also concerned about how the proposed actions would affect soil movement. In response to this concern, the project design includes several requirements, including buffers around streams and the management of logging operations to minimize soil loss from the Project Area. The effects of the proposed actions on soil are discussed in the EA on pages 27-32. In summary, due to the design criteria, listed on EA pages 12-15 and 19 design of the proposed actions erosion is anticipated to be minimal and if it occurs would be short term.

2. If logging activities are expected to occur within any riparian areas (extending outward from the channel migration zone for a distance equal to a site potential tree height) the impacts of those activities should be given particular attention. Some of the specific areas proposed for logging, in the Windjammer Project, are adjacent to areas there were logged in the 1960s and 1970s. An analysis of erosion and sedimentation following that logging would be helpful in understanding the possible effects of the proposed Windjammer Project.

Discussion: All significant riparian areas, streams, large seeps etc. would be buffered and no harvest would be done in the buffers. It is difficult to compare what was done in the stands that were logged in the 1960s and 1970s because they were clearcut and done so with large machines with less efforts to protect the soil and streams, while the proposed units would be thinned and the design features of the logging would provide a much higher protection of the soil and water in the Project Area including Drift Creek.

3. **Landslides:** This issue is a particular concern as a consequence of catastrophic erosion, i.e. landslides after logging. After logging in the Schooner Creek watershed in 1999 there were numerous landslides in the logged areas. These resulted in debris flows and sediment runoff that buried the water intake at the City's water treatment plant. This is very real concern to us, since our efforts to correct the damage done to our water intake have been subjected to expensive and onerous requirements by the National Marine Fisheries Service. We do not relish the idea of going through the

process and expense again as a result of new landslides and sedimentation from further logging in the watersheds. The environmental assessment of the Windjammer Project should address landslide issues in detail, including the susceptibility of the specific logging sites to landsliding, the effects of landsliding and the potential for increased erosion in any landslide area.

Discussion: We are very concerned about how the proposed actions may affect soil instability. In response to this concern, those areas of instability in the stands have been excluded from logging and road construction. In summary, all of the unstable areas would be avoided, and the thinnings, logging methods and time year this would be done would reduce the risk of causing instability to occur.

4. Siletz Bay: Another area of concern is the cumulative impact of logging activities on Siletz Bay. Siletz Bay is an important estuary and is a National Wildlife Refuge that hosts several protected species, including listed anadromous fish species such as coho salmon and sea-run cutthroat trout, marine mammals including harbor seals and elephant seals and protected birds including bald eagles and brown pelicans. Moreover, Siletz Bay is an important recreational resource for Lincoln City, and since recreation is the lifeblood of the Lincoln City economy, it is an important economic resource as well. More than 25 years ago the U.S. Army Corp of Engineers, in a review of Siletz Bay wetlands, made the following observations, “Overall, the bay has been seriously abused by logging sediments. A major question raised by long-term residents and resource experts regarding sediment rates in the estuary, which may be substantial enough to require restorative measures, such as silt removal and the removal of landfills, to ensure the estuary long term survival.” Obviously, in the years since that statement was made there has been extensive logging on Forest Service lands draining into Siletz Bay, and there has been further sedimentation in the bay as a result. The environmental assessment should address the cumulative impacts of logging-related siltation over the years and what the Forest Service must do (and when) to remedy the damage it has done to the functional integrity of Siletz Bay.

Discussion: The proposed actions are designed to minimize sediment delivery to the streams and we anticipate none would reach the Bay.

The need for this EA to address cumulative impacts of logging related to siltation over the years and what the Forest Service must do to remedy the damage to the Bay is outside the scope of this EA. It is expected, however, due to the timing and design of the proposed commercial operations that the amount of sediment that may be generated would be insignificant.

5. Herbicide and pesticide use: We are concerned about possible effects on our drinking water and recreational resources from possible herbicide and pesticide use. The EA should address whether they are proposed to be used, and if so the specific ones to be used and their known effects and persistence and the means to be used to preclude introduction of the chemicals into the City’s drinking water supply.

Discussion: There are no plans to use herbicides or pesticides with or as a result of these proposed actions.

6. **Fuel spills:** The environmental assessment should address the types and amounts of fuels that would be stored in or otherwise brought into the watersheds and the likelihood of spills resulting from accidents and other causes such as vandalism (the City is aware that vandalism of logging equipment and supplies is a chronic problem, especially on weekends and holidays). In this regard there should be a discussion of the reasonable worst case spill resulting from the Windjammer Project, the most likely spill resulting from the Project and what steps would be taken to prevent, contain and clean up any spills before they affect the City's water supply.

Discussion: No large quantities of fuel would be stored on National Forest Land. If storage of fuel greater than 1,400 gallons occurs, a spill response is required.

7. **Fires:** Attention should be given to proposed methods of extinguishing fires, especially by chemical means. The assessment should address estimated response times with delineated routes for firefighting contractors, especially if chemical means are expected to be employed. Both intentional application of firefighting and fire suppression chemicals and accidental spills should be addressed.

Discussion: The design of the commercial thinning and the design criteria (mitigation measures) included in this EA and timber sale contracts are designed to prevent unplanned ignitions. If one does occur, the Siuslaw Land and Resource Management Plan includes standards and guidelines to prevent chemicals reaching water sources if they are needed to suppress an unplanned ignition.

It is difficult to determine which routes may be used in response to a fire, because the location of a fire would change how best to access it.

8. **Roads:** The EA should describe any new roads, culverts, waterbar locations or decommissioned culverts expected to result from the Project, how they would be maintained, and their effects on down stream water quality.

Discussion: The proposed new short segments of temporary roads are discussed, EA pages 19, 27, 28, 34, 35, and 36. In summary, these short road segments are located on ridges or relatively flat ground and do not cross any streams. They would be closed and waterbarred once commercial operations are finished in the stand they would access.

Oregon Natural Resource Council

1. Our map indicates that the Project Area includes significant acreage of uninventoried roadless area. These areas provide important ecological benefits and no new or temporary roads should be built in these areas as part of this project.

Discussion: The discussion of effects on uninventoried roadless areas is outside the scope of this project. The delineation of these areas and development of standards and guidelines for management of these areas must be done at the Forest level and not the project level. This has not been done for the Siuslaw National Forest.

2. In general ONRC supports thinning that enhances forest health. In Late Successional Reserves we support variable density thinning of these young stands if there is no road construction.

Discussion: Alternative 3, described on EA page 20 was developed to address this concern.

3. In young stands in Riparian Reserves, we support thinning activities that enhance the development of trees to shade streams or become sources of coarse woody debris, as long as these activities do not result in yarding corridors, roads or other yarding activities impacting water quality and aquatic habitat.

Discussion: The water quality and aquatic habitat would be protected, because all of the major water sources, including streams, ponds, seeps etc are buffered to prevent logging operations affecting them. Within these buffers no harvest would be done. The harvest effects on water quality are discussed, EA pages 34-35 and 52-55.

4. **Water Quality:** Project analysis should separately discuss each of the Aquatic Conservation Strategy objectives. Any commercial harvest activities or road construction in key watersheds or municipal watersheds should be avoided in order to protect water quality.

Discussion: On March 22, 2004 the USDA Under Secretary for Natural Resources and the Environment signed Record of Decision (ROD) amending the Northwest Forest Plan. The decision clarifies provisions relating to the application of the ACS. Specifically, the amendment removes the need for deciding officials to certify that individual projects meet ACS objectives at the site-specific level and short time frames. Instead, the ROD requires individual projects to meet ACS standards and guides and that ACS objectives be met at watershed or larger scales (5th field hydrologic fields or greater) and over longer time periods of decades or more. Project records must also demonstrate how the decision maker used relevant information from watershed analysis to provide context for project planning.

Relevant information from the Drift (Siletz) Watershed Analysis (September, 1996), and the fisheries Biological Assessment, Windjammer Project was incorporated by reference into this environmental analysis. Based on this information, all project activities will meet the ACS standards and guides, and all ACS objectives will be met at the 5th-field watershed scale and over longer time periods of decades or more.

5 Roads EA: The Forest Service is required to justify the need to for new roads and prioritize efforts to maintain and decommission roads considering environmental and economic implications. (The EA/EIS must clearly state whether any roads are proposed or construction or reconstruction within Riparian Reserves, and which of these if any would require stream crossings.

Discussion: The EA discusses the need for temporary roads and their effects, EA pages 6-10, 18, 28-32, 33-34-36, and 52-55. The table on page 18 displays the location of the proposed new roads in relation to the Riparian Reserves. In summary, these roads are needed to treat portion of the stands that cannot be reached by conventional yarding systems from existing roads without damage to streams or unstable areas. These stands were clearcut with large equipment that at the time could bypass or cable yard above many of the streams and unstable areas to reduce the amount of roads needed. It is expected that the proposed stands would be commercially thinned with smaller equipment that cannot by-pass these areas or go through them and not do unacceptable damage.

C Response to the EA Comments

Appendix C includes the substantive comments received during the 30-day comment period, which began January 26, 2004 and concluded on February 25, 2005 and a Forest Service response to each comments. Comments were received from the Oregon Natural Resources Council and one individual.

Comment 1

We appreciate the variable density thinning objective for this project. We support heavy thinning to 16 trees per acre on ¼ acre patches covering a small portion of the treatment areas. Creating gaps via heavy thinning is better than mini clearcuts that are sometimes proposed as “gaps.”

We wish that you would use variable density thinning prescriptions in all young stand thinning projects regardless of land allocation. Uniform spacing basically sets up the need for future thinning that the agency may not have sufficient funding, capacity, and public support to accomplish. Whereas variable density thinning leaves more options for either more or less intensive management in the future and is a good hedge against uncertainty. The benefits of variable density thinning include: creating a patchy variety of conditions of light, heat, wind, moisture, competitive stress, and hiding cover within the stand and the landscape; setting up the stand so that there are future “winners” and “losers” (the winners become big trees and the losers become snags and coarse woody debris), etc.

Forest Service Response

The prescriptions for thinning the Windjammer units were designed to emphasize variability (EA, p.16). Methods to achieve this goal include:

Uncut Areas: Of the plantations being entered, only 68 percent of their gross acres will actually be thinned (EA, p. 38 as well as Windjammer project map). At least 10 percent of each thinned stand will remain uncut. Where less than 10 percent of the plantation area has been tagged out by the unit boundary scattered ¼ acre leave areas have been designated within the harvest boundary (Units 17, 18 and 19).

Between Stand Variability: Units would be thinned down to an average stocking of approximately 60 to 105 trees per acre depending on site-specific concerns and objectives:

- In stands at risk from windthrow, thin to a level that would allow individual tree development and not jeopardize the integrity of stand from being blown down, approximately 90 to 105 trees per acre. This level of thinning makes it likely that these stands would benefit for thinning again in about 10 years to further assist their development. This specifically applies to Units 1, 2, 9, 17, 18 and a portion of 19. These units are all located along the paved portion of Forest Road 1700.
- Units that are not at risk from blow down would be thinned to levels that would limit the number of future entries, approximately 60 to 80 trees per acre. Limiting the number of entries is recommended in the LSRA (p. 48) for land in Late-Seral Landscape Cells. The project area, except for Unit 8 and a portion of Unit 9, is in the Drift (Siletz) Key Watershed. Limiting entries is compatible with the emphasis on reducing road mileage within Key Watersheds.

Within Stand Variability: Thin to variable densities and reserve unthinned areas within each stand. Thinning would generally be “from below”, i.e. generally the shortest trees would be cut and the tallest left.

- Except for unit 14, cut trees would be selected through “designation by description” (dxd) rather than tree marking (see figs. 1, 2 & 3). Under this method, the largest (dbh) tree in an area is identified and all trees that are within a specified distance of that tree are cut if they have been identified as harvest species. The next largest tree is then identified and the process is repeated. As an example, a 15 foot dxd prescription in a well-stocked unit would result in spacing between trees ranging from a minimum of 15 feet to a maximum of about 30 feet, and generally averaging out over the unit at a spacing of 22.5 feet or roughly 86 trees per acre. Dxd prescriptions for the Windjammer project vary from 13 foot dxd up to 20 foot dxd. Plots taken in units where dxd prescriptions are applied reveal a great deal of variability. Most units would have trees left at stocking levels that vary from a low of 60 trees per acre to a high of 140 trees per acre. Because the tree selection focuses on leaving the tree of largest diameter, the result is basically a “thin from below”. However, due to the way trees are distributed, some smaller trees are left. Damaged, “defective” trees such as those with crooks, cat faces, etc., are also left because the selection criteria are based solely on diameter.
- Sitka spruce, Pacific yew, and western redcedar would not be included as harvest species in any unit. Except for Unit 14, red alder would not be harvested in any unit except for trees cut during road opening and landings clearing. Besides Douglas-fir, western hemlock would be harvested in units where it comprises a large percentage of the trees per acre and occurs at densities that require thinning (13 out of 22 units). Leaving hemlock in certain units would contribute significantly to the variability of tree spacing.
- Within units 1, 4, 5, 6, 8, 10, 11, 12, 13, 15, 17, 18, 19, 21, 22, 23, 24, and 33, ¼ acre patches would be thinned to 16 trees per acre. This would promote open grown characteristics and permit more light to reach the forest floor, promoting understory tree development. These patches would not occupy more than 10 percent of the stand area (EA p. 16).
- Selected dominant trees within units 1, 2, 4, 6, 8, 10, 11, 12, 13, 15, 21, 22, 23, 24 and 33 would be thinned more heavily around them to cultivate the development of deeper crowns and longer limbs (EA p. 16).
- Forest Service personnel plan to mark Unit 14 in a manner that would result in a patchy tree distribution.
- Unit 15 would have a dxd prescription for the Douglas-fir and a diameter limit on the western hemlock. Diameter limit refers to cutting all trees within a certain diameter range.
- In a few cases, prescriptions would vary between areas of the same harvest unit (Units 6, 15, 19 and 22). For instance, one portion of a unit, predominantly Douglas-fir, would be thinned to 70 trees per acre while a ridge-top portion, characterized by densely stocked hemlock, would be thinned to 110 trees per acre.

The dxd prescription would result in defective trees being left although certainly not all of them. Under dxd, the selection criteria is based solely on diameter and spacing, no conscious choice is made to leave or take a tree based on its health or condition. Individually marking trees has become unrealistic in light of reduced funding.

Comment 2

One of the big challenges of variable density thinning or any restoration thinning regime, is that thinning tends to “capture mortality,” yet the trees that are removed represent future snags and down logs and are valuable (even essential) components of any complex forest. Managing for decadence is not a trivial issue because this project is located in spotted owl critical habitat and spotted owl prey are associated with high levels of dead wood.

Page 38 of the EA notes that thinning would decrease snag and down wood, but the EA should do more to mitigate this known adverse effect by suggesting creative ways of managing for decadence. We support the plans to leave 48 acres untreated to encourage future mortality from competition, and to create 7-10 snags/acre on 222 acres, and create dead wood habitat non-commercially on 30 acres adjacent to a few units, but the scope and scale of this effort should be increased. The desired future condition described on pages 9 and 10 of the EA sounds very good; however, the DFC should recognize the desirability of more abundant snags and dead wood. Also, the DFC calls for retaining some” trees with defect, but because the privileged and simplified history experienced by the 30-48 year old trees, we urge that more emphasis be placed on identifying and retaining defective trees (forked, broken top, leaning, etc). In a natural setting, young stands would typically grow up with snags falling down around them for 50 years, resulting in larger numbers of defective trees compared to a those planted stand that lack significant legacies.

Forest Service Response

In addition to coarse woody debris creation discussed in the EA (p.19), approximately 32 percent of the area comprising the stands being thinned would remain uncut. In these areas mortality will be on going as the result of competition, disease, physical damage, etc. The use of the dxd prescriptions results in trees being selected solely on size and spacing, defective trees or trees likely to blow down because they are growing on logs, etc. Although the stands are young plantations, defect such as crooks, forks and bear damage are relatively common. Forks are almost certain to break out due to wind and bear damage results in butt rot. Dxd prescriptions also result in some of the lower crown classes, particularly intermediate trees being left. These trees have small crowns and are quite likely to die from competition. Thinning would result in some additional damage from tops being broken out and tree rub. Damaged leave trees are not removed. Trees over 20 inches in diameter, no matter what their condition, are not removed or even cut unless they occur in yarding corridors. Although thinning would result in snags being cut or knocked down, they would remain on site. The stands do not contain “remnant trees” or large snags; the weighted average diameter of snags in the units was 10 inches dbh. Not all natural young stands “grow up with snags falling down around them for 50 years.” Research indicates that the very large, old trees that characterize old-growth stands appear to have begun in very open stands with few trees per acre. Typically, very high inputs of woody debris occur after fires or major wind storms (such as the Columbus Day storm) and then decline as the “wood bank” of the mature forest is gone and inputs are drastically reduced. One purpose of thinning these young stands is to speed up the diameter growth of the remaining trees so that they can contribute long-lasting snags and down wood. These stands are still very young, over the life of the stand it is expected that tree mortality from blow down, disease, etc. will continue to occur.

Comment 3

Units 14 and 24 stand out as having relatively lower numbers of live trees per acre and especially higher numbers of snags per acre (EA p 41). Maybe these stands are already self-thinning and do not need additional encouragement. We fear that the high snag abundance will be lost after harvest. Please consider dropping these units or making an effort to retain high numbers of snags.

Forest Service Response

The snags per acre in Units 14 and 24 reflect extensive bear damage (Unit 14) and root rot (Unit 24) rather than self-thinning. If self-thinning was a criterion for leaving stands alone we wouldn't thin stands, it is an indication that the stand is crowded and competition is taking place. The trees per acre in unit 24 are not particularly low (208 trees per acre). Thinning would not remove root rot from the stands and it is expected that mortality will continue. Western redcedar would be planted to maintain trees in these areas. The trees per acre in Unit 14 are on the low end (174 trees per acre) and thinning on this unit would probably have been postponed this entry except for the concern that bear damage was so extensive that it was jeopardizing the stand's ability to develop long-lived trees. The bear damage is characterized by exposed rotten wood at the base of the trees. Individual tree marking is prescribed for this unit to create a patchy leave tree distribution and to favor sound leave trees as much as possible. Thinning would by no means remove all the bear damaged trees but it would afford the opportunity to plant understory trees that would hopefully escape the same fate.

Comment 4

The snag dynamics white paper on the DecAID website indicates that timber harvest typically results in the loss of a majority of the standing snags (62 percent of snags within a variety of timber harvest areas were cut down.). This is very troubling. The agency must start by carefully designing the project to keep workers away from snags. The agency must then consciously and very deliberately manage for decadence in the design of all thinning efforts. One way to think of this is to figure out how many trees the agency think they want to kill and remove a small portion of those while leaving the remainder as standing snags or down wood. When determined to be necessary, snag creation must be a creative endeavor. Trees killed in different way will die and decay in different ways. A variety of techniques should be used within and between stands: girdling, topping, infecting with heart rot fungus or other native pathogens, etc.

Forest Service Response

Dead trees (snags) would not be felled unless necessary to provide for operational safety of those working in the units as required by OSHA. The felled snags would be left on site to serve as coarse woody debris.

Comment 5

The EA appears to contemplate winter logging and hauling. Since this is a LSR and key watershed, and since the unpaved portion of the haul routes crosses 24 streams where impacts can be expected, we object to the soil and water impacts associated with logging and hauling during wet weather.

Forest Service Response

The planned winter haul units are 1, 6, 8, 9, 10, 12, 18 and 21. Units 1, 8, 9, 10 and 18 are ridge top units that are located adjacent to the paved Forest Road 1700 that is the primary log haul route for all of these units. Units 12 and 21 are located on a ridge-top accessed by a gravel road on the ridge that is in good condition with one intermittent stream. Unit 6 is on ridge top accessible by a gravel road

in good condition with three small intermittent stream crossings. The total crossings are four not twenty four. These units were selected for winter haul because of their close proximity to the paved 17 Road and the portion of the haul routes that are gravel and do not cross major streams. The closest crossing to coho habitat during winter haul is 1.3 miles. (Biological Assessment, Windjammer Project, February 2005- Fish, page 9). In addition, implementing the design criteria listed on pages 12-15 and 19 of the EA., the effects are expected to be minor and localized. In their letter of March 3, 2005, NOAA Fisheries, concurred with the conclusion in the Biological Assessment that the effects of the proposed action, when added to the baselines and combined with other actions, is unlikely to cause adverse effects or incidental take of Oregon Coast salmon or adverse effects to proposed critical habitat, and because the habitat requirements for Magnuson –Stevens Act (MSA) managed species in the project area are similar to that of the Endangered Species Act (ESA) listed species, and because the conservation measures that are included as part of the proposed action to address ESA concerns are also adequate to avoid, minimize, or otherwise offset potential adverse effects to designated essential fish habitat, conservation recommendations to meet MSA are not necessary.

Comment 6

Lincoln City (EA-Other issues section) raised some serious concerns about landslides. They asked that unstable slopes be identified and protected. The EA says it was done but it was not documented. The EA should disclose all the potentially unstable areas on maps, and if thinning is proposed the EA should discuss the costs and benefits of thinning in and around those areas.

Forest Service Response

Unstable areas identified within the harvest units were excluded from harvest. In unit 22 a small rotational slide was found within the proposed harvest unit boundary. This area was removed from the harvest unit and a buffer of approximately 100 feet was established around the upper limit of instability. This allowed a large buffer of a sidecast area, above a rotational bench at the top of a small stream bank slide (0.1 acre). While thinning in this area would not likely add to the instability problem we did not want to thin here due to the location of the small slide above key Forest Road 1900. An area in unit 24 below the same key Forest Road 1900 showed signs of instability, steep slope of approximately 70 percent with some exposed soil and ravel and with several trees with pistol-butt trunks. In the southeast corner of unit 13 there was an unstable head wall area identified and buffered out of the unit and in Unit 5 a large buffer of 75 feet minimum and 100 feet on average was established to protect the steep slopes down to Bluff Creek.

The areas are identified on the ground, removed from the harvest unit and documented within a specialist report. These small unstable areas have not yet been mapped in Geographic Information System (GIS) due to limited personnel time and funding.

Comment 7

Lincoln City (EA-Other issues section) also asked for a cumulative impacts assessment on Siletz Bay. The EA does not appear to address the issue. Even if this project will have minimal effect, it is important for the decision-maker and the public to know how these small impacts contribute to the overall level of impact on the Bay. Private land logging is probably still causing significant impact.

Forest Service Response

There are no expected direct or indirect effects on water quality as a result of implementation of the proposed alternative (EA, page 33). All project components thinning timber, reopening existing roads, building new temporary roads is occurring high in the watershed. Much of the activity would occur in the summer months when the already small streams (1-2 foot bankfull width streams) are running dry if intermittent or flowing at a much reduced level if perennial. The streams within the units are laden with large wood and have a high stream channel complexity. If sediment did reach a stream channel as a result of the planned actions this channel structure would act to retain sediment and it is believed that sediment would be captured and retained within 100 feet of entering. Similar is true of temperature, adequate stream buffers, averaging 50 feet from each side of any perennial stream, coupled with stream aspect and slopes of the stream banks down to the water provide considerable shading. Also, most of the access roads are high in the watershed along ridges with no hydrologic connection. Cumulative effects result from incremental impacts of proposed activities when added to other past, present and reasonably foreseeable future actions regardless of what Agency or person undertakes such other actions. If there are no expected direct or indirect impacts on water quality from the proposed activities, cumulative effects are not anticipated.

Comment 8

One of your evaluation criteria should be whether any short-term degradation of ACS (Aquatic Conservation Strategy) objectives is off-set by long-term benefits brought about by the proposed action. For example, sediment caused by culvert work will generally be off-set by better fish passage and or better accommodation of high flows. And some in isolation, weeds, and soil disturbance from logging can be off-set by enhanced understory diversity and increased growth of conifers brought about directly by the canopy reduction. However, extensive road construction or road reconstruction will not be justified by a small restoration thinning effort. And ground-based logging that allows heavy equipment off of roads may cause significant soil disturbance that will not be offset by any intended benefits to the vegetation.

Forest Service Response

The Biological Assessment, Windjammer Project, February 2005, submitted to NOAA for this project contains a more detailed analysis of this project and its effects on the aquatic environment. Potential short-term adverse effects were carefully analyzed and mitigated where necessary.

Comment 9

The proposed re-opening the roads into proposed units 31 and 33 should not be done and both of those units left to mature without human intervention. North Creek, which has never really recovered from the initial culvert placement under Road 19, needs fewer roads and more protection than any other creek in the mid-Drift Creek watershed.

Forest Service Response

The protection of water quality and fish habitat in North Creek was a very important consideration in our analysis. To ensure this, we included the following measures:

- Buffer between units and the stream average 150 feet. This was done to insure that no sediment would reach the stream. These buffers provide that protection while still allowing us to thin overstocked plantations to encourage the development of large trees.
- Cable yarding would minimize the potential for soil movement, EA, page 29.
- The roads into these units would be used only in the dry season. They would be closed once commercial thin operations are completed in each unit. If sediment is generated from these roads, it would not reach North Creek due to its distance from these roads.

Comment 10

The EA also indicates that harvest will not occur during the wet months (November through February). The EA should be amended to indicate that haul operations will also be suspended during the wet months. Fifty years of experience in the Drift Creek watershed leads me to believe that far more damage to the ecosystem is done by wet-season hauling/transport on poorly maintained roads, than is done during a harvest conducted during the dry season.

Forest Service Response

We agree with your concerns regarding the potential adverse effects of winter haul on poorly-maintained roads. For this reason, we are confining winter haul to those units near the paved Forest Road 17 where the haul routes consist of either paved road surface or a good gravel surface with no major streams crossings. We are also implementing specific design criteria (EA pages 12-15 and 19) to minimize sediment that may reach streams.

Comment 11

Temporary roads still cause serious adverse impacts to soil, water and wildlife, and spread weeds. Decommissioning such roads is not entirely successful and the soil compaction effects can last for decades. The agency should consider avoiding building spurs by treating some areas non-commercially (e.g. thin lightly, create lots of snags, and leave the material on site).

If young stand thinning requires construction of temporary roads, the agency should do an analysis that illuminates how many acres of thinning are reached by each road segment so that we can distinguish between short segments of spur that allow access to large areas (big benefit, small cost) and long spurs that access small areas (small benefit, big cost). This can help inform the decision-maker's balancing of the costs and benefits of thinning and roading. Alternative 3 should be selected alternative. It still thins 900 acres but forgoes commercial treatment of 62 acres that cannot be accessed unless new temporary roads are built. We urge you to think hard about whether the impacts of building ½ mile of road is acceptable and justified by the benefits of thinning an additional 62 acres. Maybe leaving the 62 acres untreated (or just manual snag creation) is a way for the forest to enjoy the benefits of mortality and greater dead wood habitat.

Forest Service Response

We agree with the need for this type of information and have included this analysis within a table on page 18 of the EA, which displays how many acres would be treated for each proposed new temporary road segment. We carefully weighed the minor short-term potential adverse effects of 0.5 miles of temporary road, in ten short segments, and the fact that these roads would be closed at the conclusion of treatment, against the long-term benefits of accelerating the development of late-successional habitat within 62 acres.

A goal of the Siuslaw Forest Plan is development of large blocks of late-successional habitat to meet:

“need for forest habitat is the need for a healthy forest ecosystem with habitat that would support populations of native species (particularly those associated with late-successional and old growth forests) and includes protection for riparian areas and waters” (NWFP-ROD, page 26) (EA page 6)

From the EA, page 7, “Presently, the young managed stands in the Project Area form rather large, contiguous blocks with relatively narrow blocks of older natural stands in-between. This fragmentation of older natural stands has diminished the amount and quality of the late-successional forest habitat. Acceleration of the development of late-successional forest habitat would provide connectivity between blocks of existing late-successional habitat, eventually creating large blocks of late-successional habitat”.

The proposed commercial thinning would treat about 68 percent of the young managed stand acreage. If the temporary roads are not constructed only about 64 percent of the stand area would be treated. Snags and down wood creation would be done on about 2 percent of the stand area not treated commercially. The remaining areas would not be treated.

The concerns of treating these 62 acres by creation snags and downwood include; to reduce the risks (from bark beetles and fire) associated with falling and leaving large numbers of trees (100+ trees per acre), it would have to be done over a protracted period of time. It is unlikely funding for such a project would be available over time and the development of late-successional characteristics would be much lower than under the preferred alternative.

A description of the temporary roads and their effects are discussed on the EA, pages 18, 32, 34, 53-55 and the Windjammer Project Biological Assessment (Fish) species, February 3, 2005, pages 1-24. In summary, the beneficial effects from thinning the 62 acres would off-set the small short-term effects from the temporary roads.

Comment 12

Logging disrupts behavior of nesting birds and could harm other aspects of their life needs. A radio-telemetry study in the north Coast Range of Oregon showed that thinning in 40-65 year old stands near a spotted owl pair resulted in the owl: (1) shifting habitat use patterns to avoid thinned areas, especially heavily thinned areas, (2) enlarging its home range requiring the owl to expend more energy to fulfill its life functions. Before harvest the study made 23 owl locations in the areas to be thinned, only one owl location was made in the thinned area during the harvest period, and only 8 locations were made in the thinned area after harvest. The area added to the home range after harvest was larger than the area harvested. Recognize that this study looked at only one bird and only looked at short-term effects in the first few years after thinning. Long term effects might be different, but because the effects of thinning could affect survival and reproductive success over the course of several breeding seasons, this could be significant for a Threatened species. Based on these preliminary findings, the authors said—

“We therefore recommend that thinning operations not be conducted within core use areas in this region until further research on this topic is conducted. ... [W]e recommends that land managers identify the best spotted owl habitat (old conifer with multi-layered canopy and abundant snags) around the nest site and designate an area where no timber harvest activities will occur. The mean (100-ha) and maximum (250-ha) size of core use areas in the North Coast Range ... should be used as guidelines for delineating reserve areas. Where forest stands are homogenous and/or the best habitat cannot be identified, an area with 600 –m radius (~115-ha) around the nest should be used.”

Forest Service Response

The closest recorded location of a northern spotted owl pair, located outside the Project Area, is one and three quarter mile from unit 33 found in 2001. (EA, page 44). The proposed actions would be done in young managed stands (plantations) that are dispersal habitat. As stated in the EA, page 45 no suitable habitat would be affected by the proposed actions. On EA pages 45-47, there may be some risk that owls and other raptors may be disturbed by the noise from commercial thinning operations. By implementation of the design criteria listed on pages 12-15 and 19, the effects on these birds is expected to limited and minor.

Comment 13

Thinning in stands of trees that are not yet of "pool forming" size should be beneficial, but after trees are of pool-forming size, thinning might just capture and remove the mortality that should end up in the stream. (In simplistic terms, a pool-forming tree is one big enough to fall all the way across the stream, so it varies by stream size). There are also two schools of thought on thinning in large wood source areas such as landslide prone areas (which are supposed to be protected in riparian reserves). Some fear thinning will increase the risk of premature landsliding while the trees are still small, and end up delivering fewer and smaller trees than if left unthinned. Others think the increase risk of slides from partial removal is minimal and these are an area where thinning should be targeted. Please discuss this question in the NEPA analysis.

Forest Service Response

The Riparian Reserve widths for the project area are established by the Northwest Forest Plan (ROD-C 30-31). The site potential tree for this forest is 260 feet. The process to change these widths is described on page B-13 of the ROD. In summary, watershed analysis needs to be completed and the Plan amended by a NEPA decision. Watershed analysis has been completed, but the forest has not pursued changing these boundaries.

Application of these widths reveals most of the project area, about 900 acres is within the Reserve, leaving about 62 acres outside the Reserve, EA page 16. Within this 900 acres area, there are unstable and stable areas. Our practice is to remove the unstable areas from the units to the extent that they would not be affected by commercial operations and thin the stable areas. Based on reviews of past thinnings in the same area, we cannot find any indication that the prescribed thinning prescriptions cause or accelerate soil movement. Creation of snags and down wood may be done in those unstable areas where a high number of stems per acre exist. The goal is to increase the size of the trees for future supply of large woody debris. Again, reducing the number of stems per acre by this method does not appear to affect soil movement.

Map

